

# MOTOR AGE

A CHILTON PUBLICATION

DEVOTED TO THE INTERESTS OF THE INDEPENDENT SERVICE STATION



Marie Wilson, glamor gal of the screen, has something besides acting on her mind. She is a miniature race car fan. She designs and repairs (at least that's what her publicity agent says) her own tiny cars—each capable of more than 60 m.p.h. with their one-cylinder engines. Racing these mighty mites has become a pastime that is finding favor in all sections of the country, particularly in the west. Turn to page 19 in this issue for a story of the fans' activities.

JANUARY  
1940

# STEEL-VENT

## *Sets the Pace!*

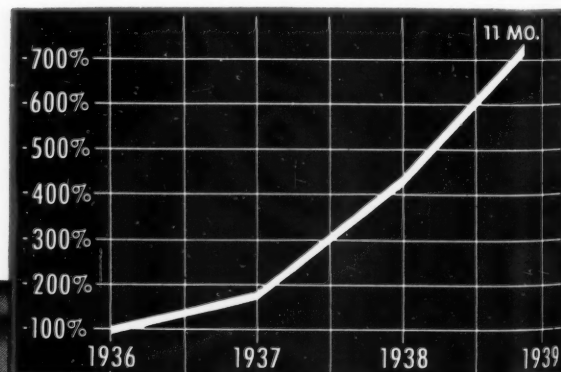


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No. 2 Small General Assortment (1937-38-39 Additions)	FL-9F
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Pontiac	FL-11F
Chevrolet Passenger	FL-12E
Buick	FL-13F
Cadillac and La Salle	FL-14F
Studebaker Passenger	FL-15C
International Harvester	FL-16D
Hudson and Terraplane	FL-17D
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For 15 years Wagner has been the acknowledged leader in the development and manufacture of Lockheed Hydraulic Brakes and the Brake Fluid which is a vital part of the Hydraulic Brake System.

Wagner is constantly developing new brake equipment to help you cut service costs—new assortments of hydraulic brake parts—new hones and gauges—new service accessories. A few of the many assortments and tools Wagner offers you are described herewith.



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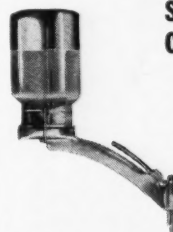
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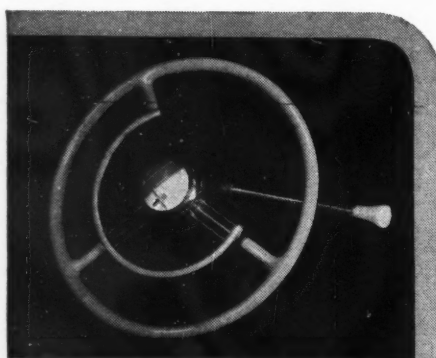
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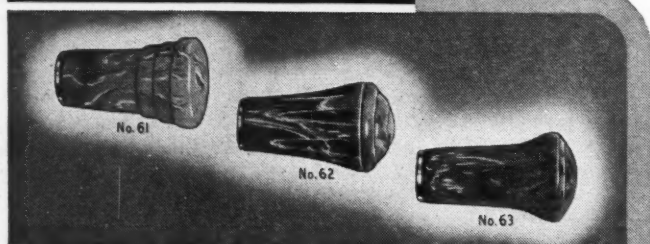
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# MOTOR AGE

JANUARY 1940

## Big Business

If the enthusiasm displayed at the A.S.I. Show in Chicago is any criterion, and I think it is, 1940 is certainly going to be a swell year. Almost every manufacturer I spoke to at the show believed that the coming year would be about 25 per cent better than 1939. As those manufacturers produce parts, equipment, supplies and accessories sold or used by the automotive maintenance field, it should be a good year for service stations.

## Old Friends

While at the show I met Cal Crooks, with whom I have been corresponding for better than two years, but that was the first time our paths actually crossed and I got a big kick out of it. I also wanted to meet my friend Ryneerson, who runs a shop way out on Indiana Avenue in Chicago, but just couldn't find the time to get out there. Ryneerson used to work here in Philadelphia, many years ago and thinks possibly that he and I worked together at one time. We will have to get together and compare notes.

## Static

It's interesting how automotive troubles seem to go in cycles. For a long time most of the letters I received dealt with oil pumping and steering troubles. Then transmission difficulties took the lead. Just now many of the letters deal with static electrical charges set up in the car. For the most part, this trouble seems to be most pronounced in recent model cars and unfortunately there doesn't seem to be any sure-fire cure, except to fasten one end of a chain to the chassis and have the other end drag on the ground. That's what the gasoline tank trucks do, but most car owners object to that solution. Dragging brakes seem to make the



## SHOP TALK

condition worse, while the installation of static eliminators on the wheel spindles, and the use of powdered graphite between the tire casing and tube reduce the amount of static considerably. Ray Sutton out in La Verne, Cal., is the latest to write in asking for help of that sort. It's a tough proposition to lick and if anyone knows of any better remedies I'd like to hear about them.

## Transmission

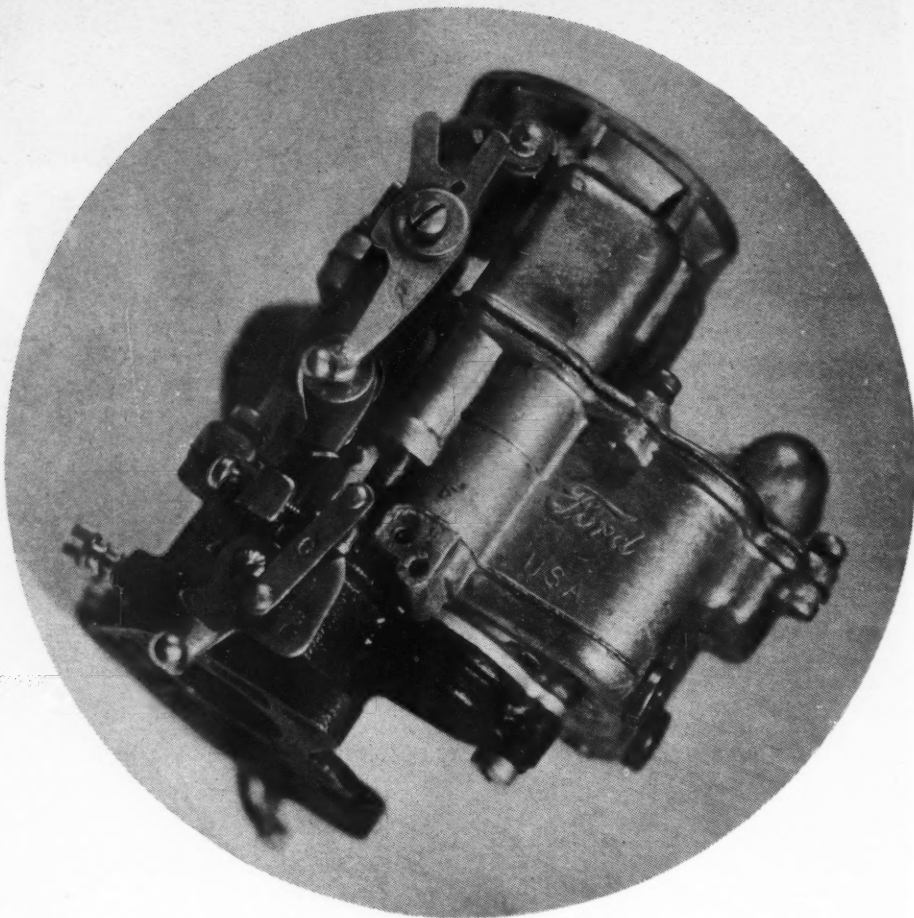
When it comes to transmission work, the main difficulty seems to

be to keep them in gear. And speaking of transmissions, I just spent a day with some Olds factory service men taking apart one of the new automatic units. They are not as tough to work on as you'd think, but believe me you have to know what you're doing. There'll be a picture story on the subject in the near future.

\* \* \*

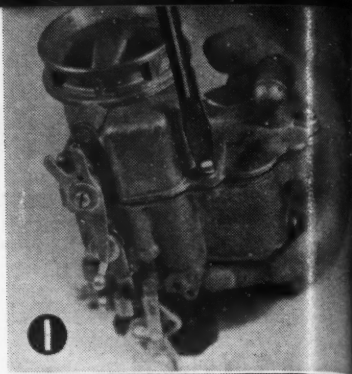
And as Ben Bernie would say "The mostest of the bestest" to youse guys for the coming year.

*Bill Toboldt*

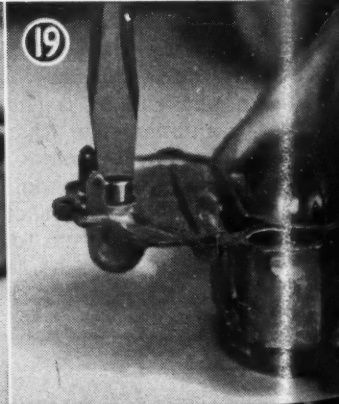
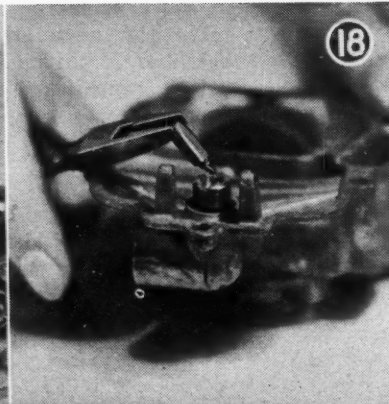
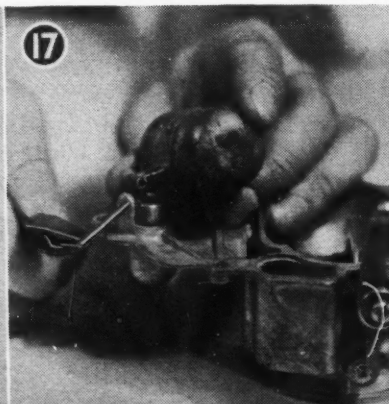
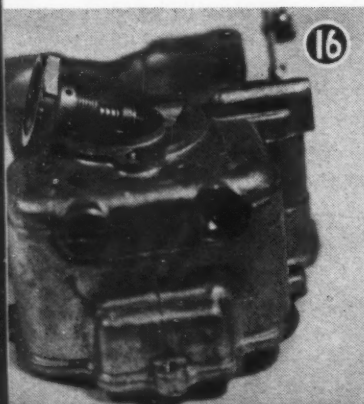
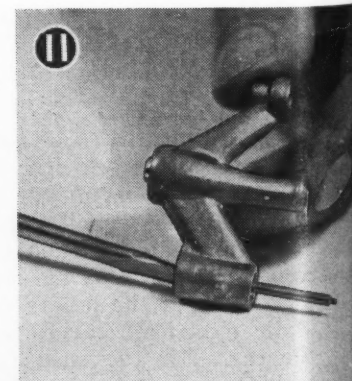


# SERVICING THE *Ford* CARBURETOR

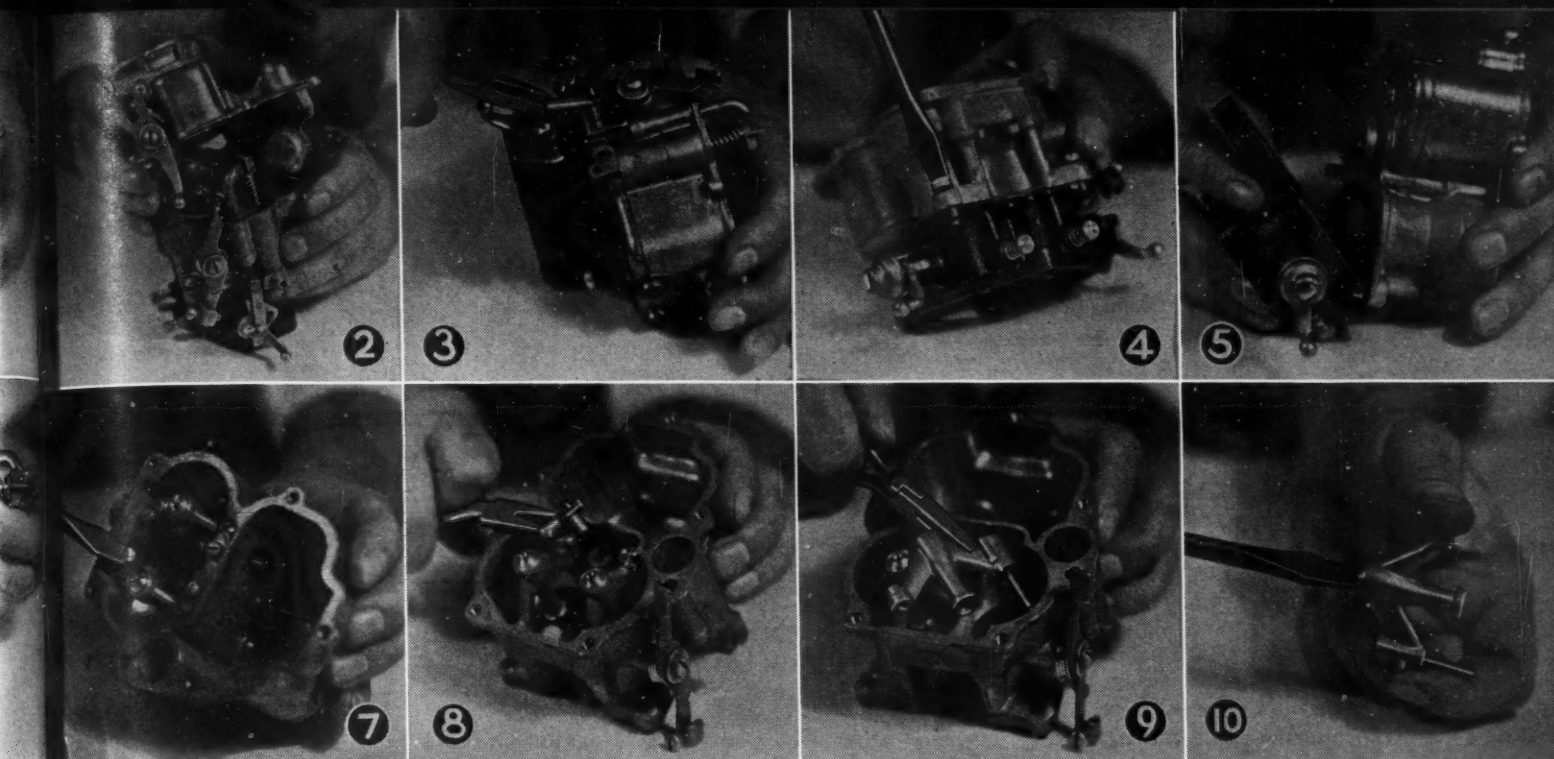
**By BOB TURNER**



1. Remove screws holding air horn assembly to carburetor main body.
2. Lift air horn assembly off as a unit.
3. Remove accelerating pump link from throttle lever and pump rod.
4. Remove screws holding carburetor main body to throttle body.
5. Lift throttle body off main body assembly.
6. Remove accelerating pump assembly.
7. Remove the four screws holding nozzle bars in place.



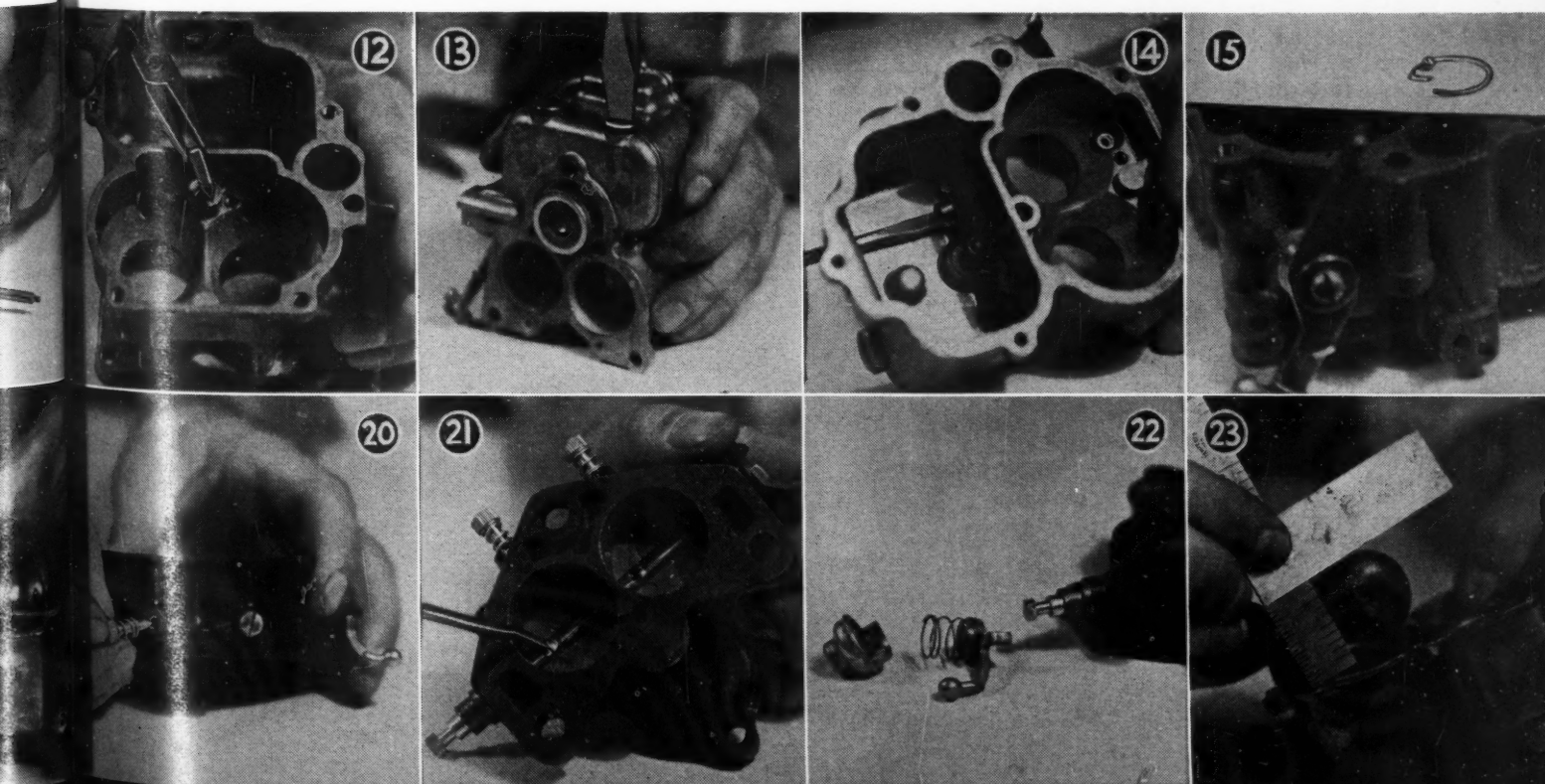




8. Lift out the pump discharge nozzle.
9. Lift out the two nozzle bars.
10. Remove the nozzle air bleed plug from both nozzle bars.
11. Remove the idle tube assembly from both nozzle bars.
12. Remove the pump discharge needle.
13. Remove the two main jet plugs from the main body.
14. Remove both main metering jets after main jet plugs are removed.
15. Remove the pump check ball retainer and ball.
16. Remove the economizer valve assembly. This assembly may be removed by using an open end wrench

- that will fit the flats cast on the valve assembly. Threads are right hand.
17. Remove float from air horn assembly by pulling out the float lever shaft.
18. Remove float needle from needle seat.
19. Remove float needle seat. Float needle seat threads are right hand.
20. Remove the two idle adjusting needles.
21. Remove the four screws that hold the throttle plates in place.
22. Remove the throttle lever hand from the throttle shaft by pressing hard toward body and rotating one-quarter turn. Then remove throttle shaft from body.

23. To set float level measure from bottom of float (not soldered seam) to machined face of casting by using two steel scales with straight edge touching bottom of float. Float level is  $1 \frac{11}{32}$  in. to  $1 \frac{1}{8}$  in.
- GENERAL:** Clean out all passages with a suitable cleaning compound and air. Allow carburetor parts to soak in cleaning compound until all gum, dirt or deposit from gasoline is dissolved.
- When reassembling carburetor reverse the above procedure. When assembling parts be sure to use new gaskets at every point requiring a gasket. Use screw drivers that fit the head of the screws being worked on.



# How to Set Breaker

**W**HEN you lift the distributor cap of a customer's car and look at those small points which make and break the circuit more than 64,000,000 times when an 8-cylinder car is driven 5,000 miles, you can't help but realize that these little fellows stand between good performance and poor performance; between normal fuel mileage and poor mileage; a peppy engine or a sluggish one; good starting as against poor starting, and a smooth engine as against a rough one.

The ignition distributor with its relatively delicate mechanism stands between the battery—the source of current and the sparks that fire the cylinder charges. No matter how good the battery, or how good the ignition coil and cables, or the spark plugs, the final sparks are pretty much determined by the breaker points. These little points not only have to break the primary or battery circuit for sparks at the plugs, but they must do this so the sparks occur at the right time for each cylinder. This time element is all-important with breaker point action.

Breaker points usually are set while they are open with feeler gages to a specified opening, but it is just as important to know the length of time the points remain closed. It is during this time that the ignition coil becomes energized or builds up its magnetic field for inducing a spark in the secondary when the points open and the coil discharges.

The ignition distributor must be mechanically and electrically correct if the engine is to give its best performance and develop its maximum power and have the desired flexibility at all speeds. A worn cam, bearing or a bent shaft easily can affect performance of the unit.

The distributor cam has several important functions. Its "dwell" or "cam angle" determines the length of time in which the coil becomes energized. The cam also is designed to open the breaker points at the

**The biggest little thing in car performance  
—it's important that they are set right**

**By B. M. IKERT**

speed required for proper action of the coil and condenser.

To adjust or set the breaker points something must be known about the operation of a distributor. Referring to Fig. 1, it will be seen at E, that the points are closed with the fiber rubbing block off the cam. If the cam is turned in the direction of the arrow the rubbing block eventually comes to a spot where the breaker points are about to open, F. Revolving the cam further the open position of the points is attained at G, with

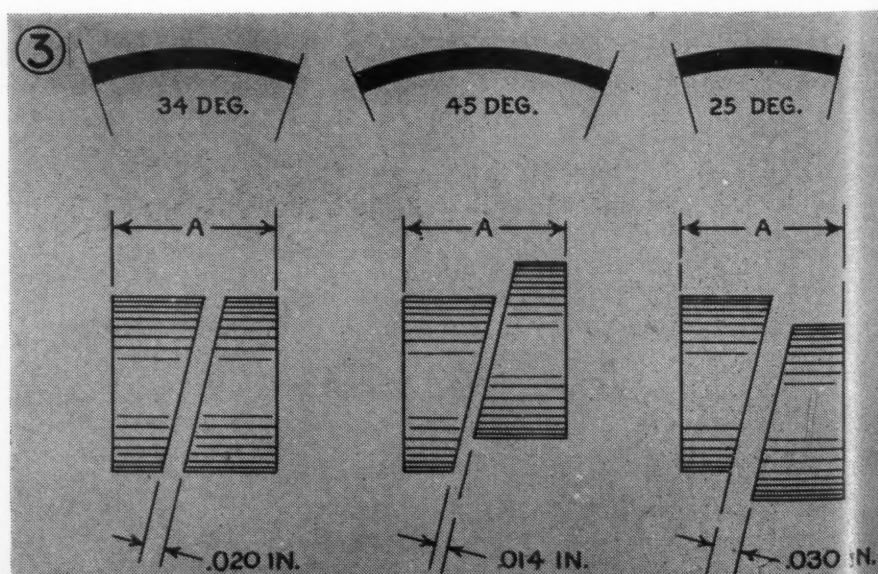
the rubbing block at the highest spot or lobe on the cam. Revolving the cam still farther, H, Fig. 1, a spot is again reached where the breaker points are closed, and the cycle is repeated again.

In Fig. 1, A and C are the angles through which the cams rotate and the breaker points are open. The "dwell" or "cam angle" is the length of time in degrees of cam travel that the points are closed. It is represented by B and D, in Fig. 1.

It is evident from Fig. 1, that

**Fig. 3—Point creepage caused by a misaligned breaker arm or worn hinge pin may cause conditions as shown here. Note how the cam angle changes with the point opening although the**

**actual distance of movement between the points is the same in each case, distance A. Fig. 4—A flat feeler easily can give incorrect readings of the actual point opening.**





# Points

wear on the fiber rubbing block attached to the breaker arm will materially effect the opening and closing of the breaker points. Thus, if the rubbing block becomes shorter, due to wear, naturally the breaker points are not opened as quickly and the dwell or cam angle becomes longer. That is, the distance B, Fig. 1, becomes greater. And, by the same reasoning, distance C, which represents the length of time the points are open, becomes less. Anything but the correct cam angle or point opening changes ignition considerably. Too much cam angle, or distance B, Fig. 1, is as bad as having too little.

First of all, the correct point opening is necessary to give the coil and condenser enough time to completely discharge. This they cannot do if the point opening, because of rubbing block or distributor shaft wear, has gone from, say, 0.022 in., to 0.014 in. It must be understood that the breaker points are not open until the spark or flame "drag-out" across the points is "out." It may take several thousandths of an inch point opening

(Continued on page 44)

Fig. 5—Feeler gauges made of wire stock are always preferable for use in setting the breaker points when distributor test fixtures are not available.

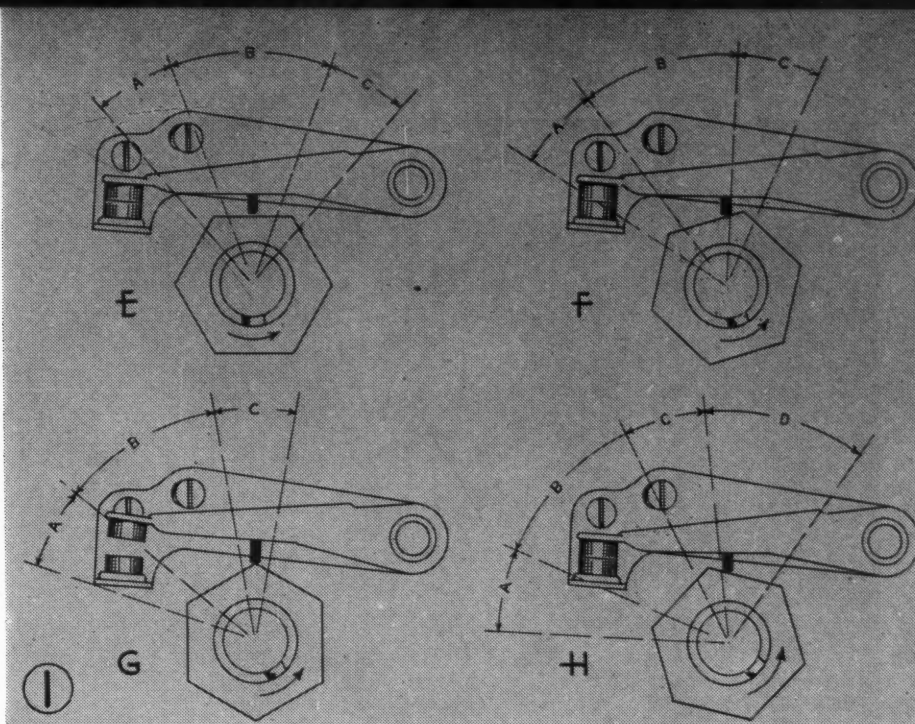
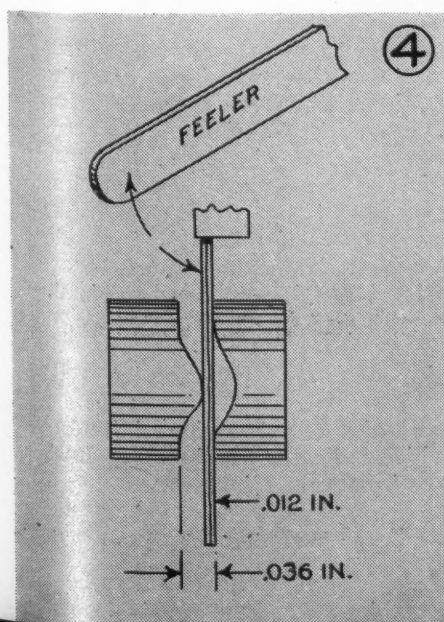


Fig. 1—Diagram showing the opening and closing of a typical set of breaker points. Angle A, shows the amount in degrees that the points are open, while B, is the dwell or cam angle during which time the points are closed and the ignition coil becomes energized.

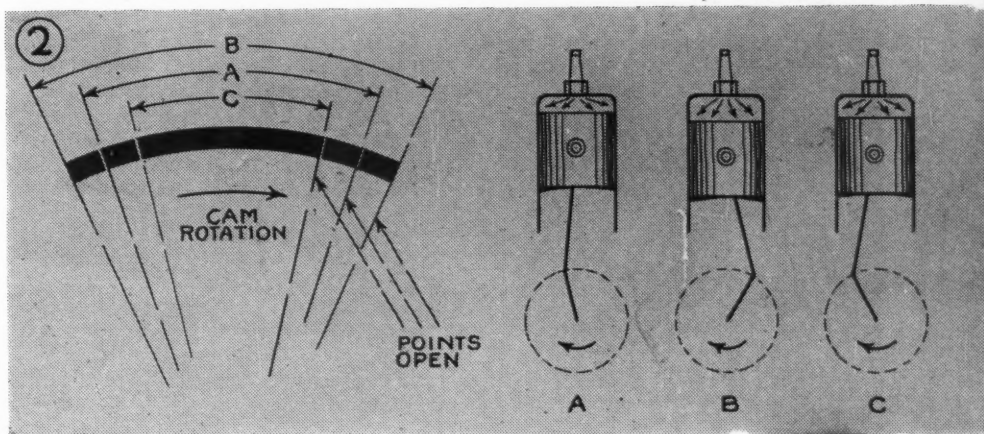
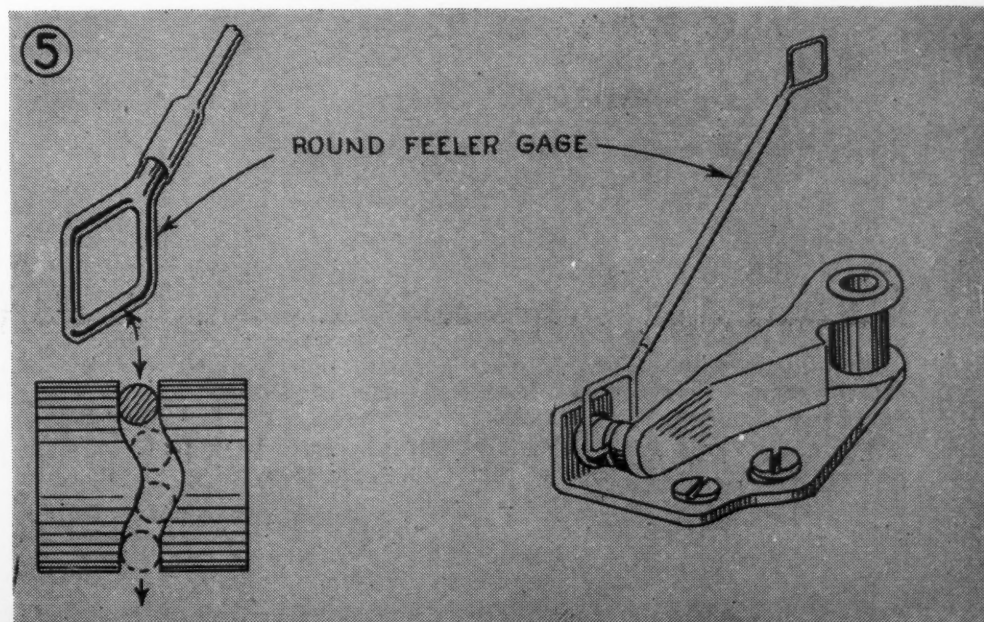
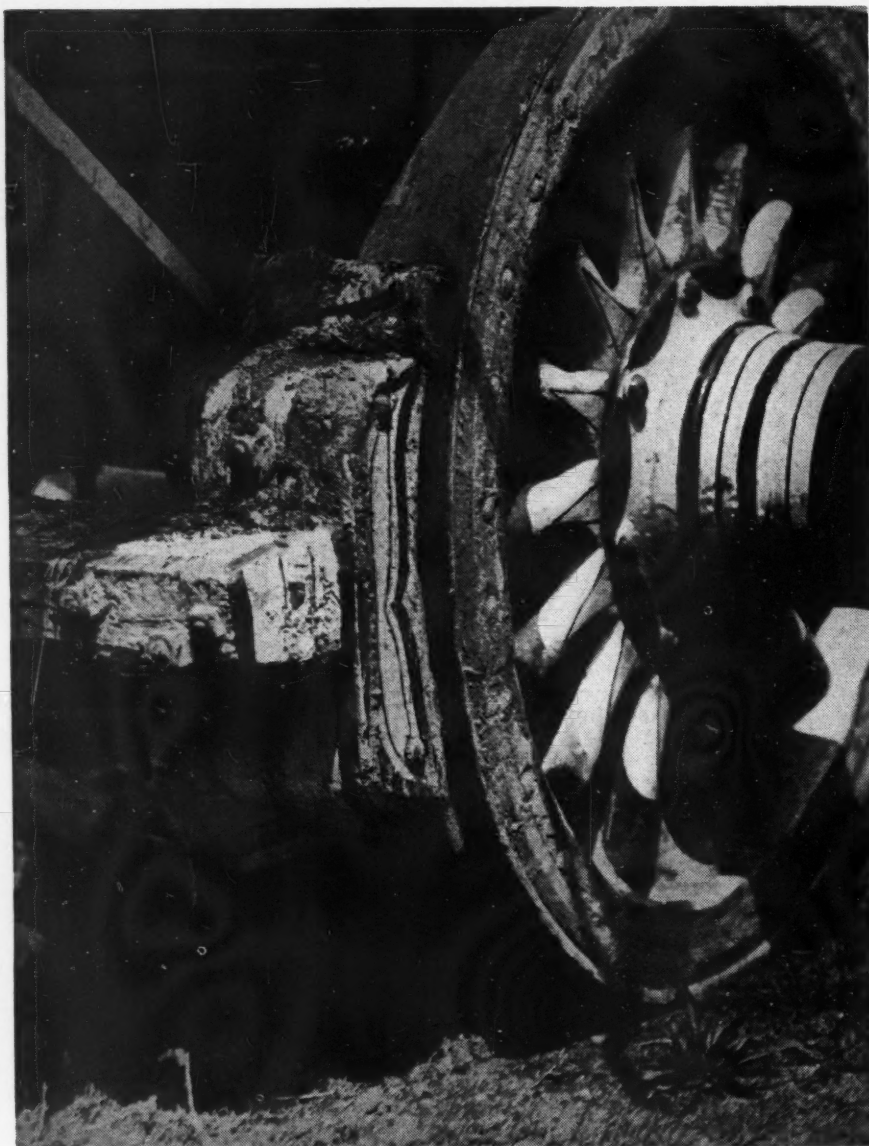


Fig. 2—This shows the effect of cam angle on the ignition timing. The spark takes place as the breaker points open. With the correct cam angle, A, the spark takes place at the correct point in the compression stroke. Too long a cam angle on the B, makes the spark occur too late, while too short a cam angle C, causes too early firing.





## THERE'S PROFIT IN BRAKE SERVICE

**—and here's an easy way to check and see  
if you are getting your proper share of it**

**F**IFTEEN out of every hundred cars that drive into your shop need brake reline jobs. Thirty-three out of every hundred need brake adjustments. In other words, 48 per cent need brake work of some sort. Those are some of the

startling facts revealed in a new manual just issued by Raybestos.

With many states having laws calling for periodic inspections, and the increased interest in safety, brake service is easier to sell than formerly. But to get his share of

the brake service business, a service station operator has to do more than ask the car owner if his brakes are in good condition. In most cases the car owner thinks the brakes are perfectly satisfactory for modern hydraulic brakes will continue to stop a car in a fairly satisfactory manner even when the rivets are cutting into the drums.

The best way to sell brake service is to pull a wheel and examine the brakes. Not only must the depth of the rivets be checked but the lining must be examined to see if it is tight on the shoes, and whether it is oil soaked. In addition, clearances must be checked; hydraulic systems examined for leaks, drums checked for scoring and shoes inspected for twists.

With a brake drum removed the necessity for relining is at once apparent even to the car owner and the sale of the necessary work is quickly made. A spongy brake pedal will indicate the need of an adjustment but the pedal will not disclose the need for new lining.

To see if your particular shop is getting its share of brake service, count the total number of service jobs you have performed during any period. A month will do but a year would be better. Then count the number of brake jobs. The brake jobs should equal 48 per cent of the total. Another method is based on the fact that 15 cents out of every service dollar is spent on brake service. To make a check on that base, find the total amount of money spent in your shop by your customers for all kinds of service and also the amount spent on brake service. For the average station, the amount spent on brake work should be 15 per cent of the total spent on all kinds of service.

In addition to the profit to be made on labor and brake lining when servicing brakes, there is profit to be made from truing brake drums, brake fluid, grease retainers, front wheel bearing lubrication, hydraulic brake parts such as cups and cylinders, brake cables, hand brake ratchets and pawls, wheel bearings, brake drums, etc. Furthermore, good brake action depends on having tire treads worn about equally and, therefore, brake service also leads into the sale of tires. Wheel alignment service can also be sold in connection with brake service as it affords the opportunity of examining tire wear, which indicates whether the wheels are in correct alignment.





*"There's a man here who wants his brakes bled!"*



# The

yet he can fix old ones more quickly, less expensively, and better than the shoe store up the street. Dresses that need altering because we have gained weight, don't go back to the dress shop where we bought them—we take them to the dressmaker or the tailor. Looking at it in this light, the garage is the logical place for us to bring automotive repair work."

"That's fine theory," said Jack. "but I don't see the women flocking in here, and yet, Bill, down the street, has an authorized agency and he does a rarin' business."

"Granted," I went on, "but it so happens that Bill gives better service than anyone around here. He's far from perfect, and the first fellow to do him one better is going to see business coming his way. It's the same old story. The only reason you aren't just as busy as Bill is that you haven't put into practice a few of the simple principles that every automotive man knows."

"Oh, I know just what you're going to say," said Jack, knowingly. "Keep 'em clean, be courteous, have a waiting room—all stock stuff. Trade papers are full of it. Now you tell me how I'm going to make my mechanic (and he's a darned good one, too) wash his hands before he touches the steering wheel? He won't do it! And what's his English got to do with his ability as a mechanic?"

That got me started. I explained to Jack that his mechanics' use of the King's English may have nothing to do with his ability, but it had everything to do with keeping me as a satisfied customer. If the boy didn't know how to talk to women, then Joe should do the contact work. We women spend a lot of money on the car, and we don't like being treated like the dirt on the floor. I wish that just once a garage man would walk up to me as other salespeople do—with a

"I DON'T know that there's much I can tell you about the garage business," said Jack, leaning back in his swivel chair until his feet came off the floor. "Let's see. I've had this place here about twenty years now, and I've about decided that the independent garage is on its way out—I mean, as a repair shop. 'Course a lot of people will still use us for storage, but we aren't equipped to service cars."

I was astonished! I had been talking with a number of garage men about the woman who buys service, and Jack, the last one I saw, was the first to say anything

or even hint anything like this.

"Why, Jack," I stammered, "Do you really believe that? It *shouldn't* be true, for the independent garage is the logical place for us women to take our cars for service. It's a lot easier to go around the corner than to trot back to the place where we bought them. Heavens! Whether or not you sell cars doesn't bother us; we don't want a new one—we want the old one fixed."

"Anyhow, most of the places women go for repair work specialize in just that. For instance, there's the Eagle Shoe Repair across the street. He's doing a pretty good business and he doesn't sell shoes;



# Lady

## DOES THE PICKING

smile and a "Good morning. What can I do for you today?" But, no. I drive into a garage and I sit and I sit. I sit until some man ambles up with a scowl and a "Well?" as if I were a ten-year-old he'd just caught foot-printing his fresh cement. The grocer doesn't treat me that way; the bread man always has a smile; the tailor is always pleasant; the butcher, the clerk, the postman—they're human enough. What do garage men eat for breakfast that makes them such cave men—cotton pins and cylinder heads?

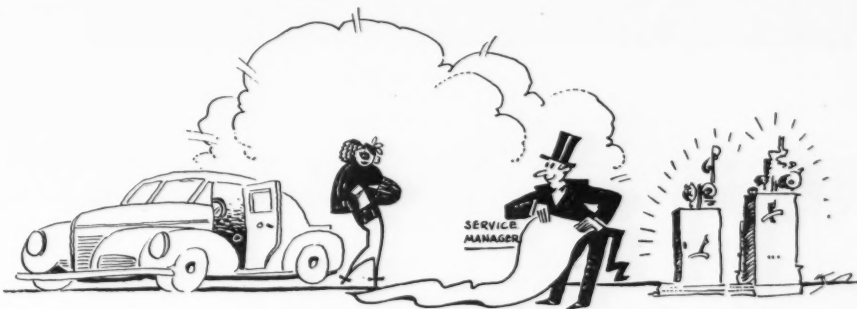
If you think this is silly, just remember the first time you went to a perfume counter to buy your best girl a Christmas present. I'll lay dollars to doughnuts that you were embarrassed and ill at ease. How would you have felt if the salesperson had said, "Well?" in that you're-taking-my-valuable-time-so-make-it-snappy attitude? Granted that women are dumb about cars, but how smart are you when the girl behind the stocking counter murmurs, "Chiffon or service weight; and did you want two, three, or four thread? Red Cedar is very good this season." It makes a whale of a lot of difference which side of the fence you're on.

There's another thing, too. We women like to deal at a nice-looking place. It's more than a "like," for we've found it good business practice. A dirty restaurant serves food which is, at the best, unappetizing. A run-down dry goods store will likely as not sell us material that shrinks and fades. Remembering these experiences, what else can we think of a man who hasn't added a coat of paint to his garage since he started there—whose only idea of decoration is a few old tires and a gasket hanging on a stray nail—except that he must do sloppy work? After all, buying service for a car is like telephoning for a steak

**—and when Hubby tells her to get the car repaired she'll pick the shop that treats her best**

**by ROSE LU GOLDMAN**

Miss Goldman is an experienced writer whose services Motor Age has enlisted to bring you a woman's viewpoint of the service business—which she does with a clarity and factual basis that make this, and articles by her which will appear in future issues, well worth your attention.



on the night the boss comes unexpectedly for dinner. You've got to deal with a reputable place, because you can't see what they're sending until too late.

"Jack, you do call for and deliver cars, don't you?" I asked.

"Only if the people look like they'll be good customers and we want them to come back. Nope," he said, rubbing a grimy hand over his chin, "nope, not very often." Well, now, that's absurd! If in the midst of getting dinner I find that I haven't enough bread, the grocer will send me over a ten-cent loaf *right away*. The milk man makes a trip every morning, but if

by afternoon I need a half-pint of light cream, a phone call will bring the man and the horse and wagon (not to mention the cream) right to my door. They'll lose on that trip, maybe, but it's more than made up in good will. They'll do all that for ten cents, and I'll bet that you can count on the fingers of one hand the bills that you've given customers that amount to a dollar or less. (If this isn't true about you, you are, indeed, a rare specimen.) You may think such services run into a terrific overhead, but I haven't heard of many dairies going into receivership.

(Continued on page 32)



# REFINISHING CRANKSHAFTS

**Standardization in grinding shafts  
will eventually aid the service man**

**O**NE reason that the automotive business has reached its present colossal size is the fact that cars and trucks can be quickly repaired by the installation of new parts which are readily available.

Naturally, anything which can be done to speed up such service work will increase customer satisfaction.

For example, some years ago when a mechanic overhauled an engine he would recondition the cylinder to the smallest oversize that would give a true straight cylinder. The result was that parts suppliers had to produce pistons and rings in an almost infinite number of oversizes. As a result of the large stocks

**By BILL TOBOLDT**

which had to be carried, and obsolescence, the price of such parts was relatively high. In addition, there were frequent delays when parts had to be finished to some special size. Furthermore, when one of those special parts failed there was always considerable time wasted in obtaining replacements.

Eventually, the piston and ring manufacturers decided on certain standard oversizes, and such troubles were eliminated.

A somewhat similar condition exists today in the crankshaft and connecting rod bearing field. When a crankshaft requires refinishing it is often turned or reground to the largest undersize which will give a true journal.

Such a condition results in many difficulties. First of all, in addition to carrying a large stock of different size bearings, the parts house has to carry unfinished bearings which can then be finished to any desired size. When such refinishing is required, extra time is needed before the bearings can be delivered, and the completion of the job is delayed.

But the difficulties continue even after the engine is assembled. On long runs through sparsely populated districts when a truck burns out an odd-size bearing, it is frequently necessary to order the part from a distant warehouse, which would seriously delay the truck. Under such circumstances, it is also often necessary to rely on relatively unskilled mechanics, who, if they have micrometers, which is doubtful, are apt to make errors in making the necessary measurements.

Under present-day conditions as many as 17 different undersize bearings are required to take care of a single model of car. By the adoption of suitable standards the number of undersize bearings could be materially reduced, and some bearing manufacturers are recommending the adoption of the following sizes standard size and .005 in., .010 in., .020 in., .030 in., .040 in., .050 in. undersize.

Whether such standards will be adopted by the industry is, of course, problematical at this time. However, shops that are reconditioning crankshafts can hasten the adoption of some standards by reconditioning the crankshafts to the

*(Continued on page 42)*



A NEW craze has hit the sporting world in the form of model racing cars, which hit a speed of over sixty miles per hour. These models, weighing only 5 lb. and no longer than about a foot, are equipped with a small fuel engine and are exact replicas of the regular racing cars, and usually costing from \$50 up to assemble. The sport has definitely taken hold throughout the country and is spreading out to be a popular hobby. The devotees are not school children, but rather mechanics who are taking development of these little gems seriously and at the same time getting a great deal of enjoyment out of it. The basic principles and regulations governing engine replacement, car weight and wheel diameter are believed to be fair. Perhaps later the size limits will be changed, but there is at present at least several valid causes for the top limit of 10 c.c.

*(Continued on page 38)*

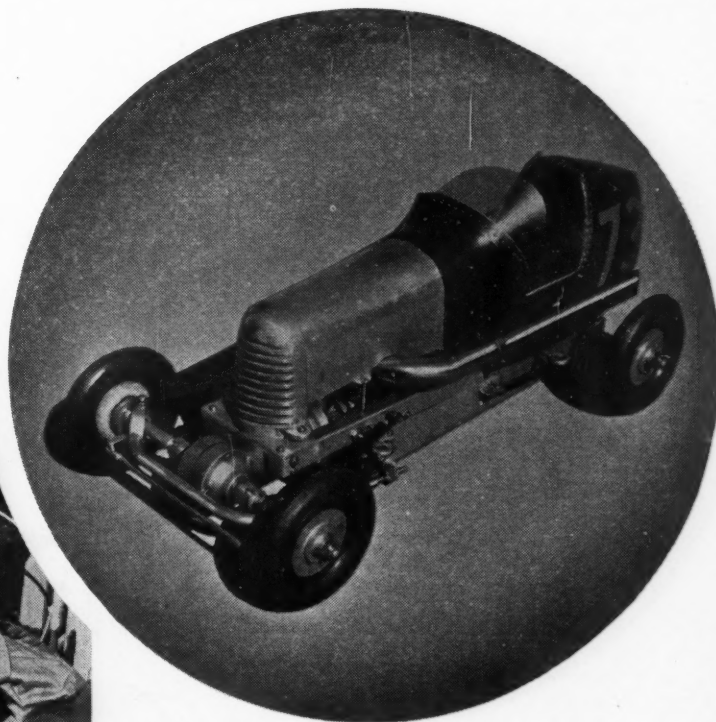
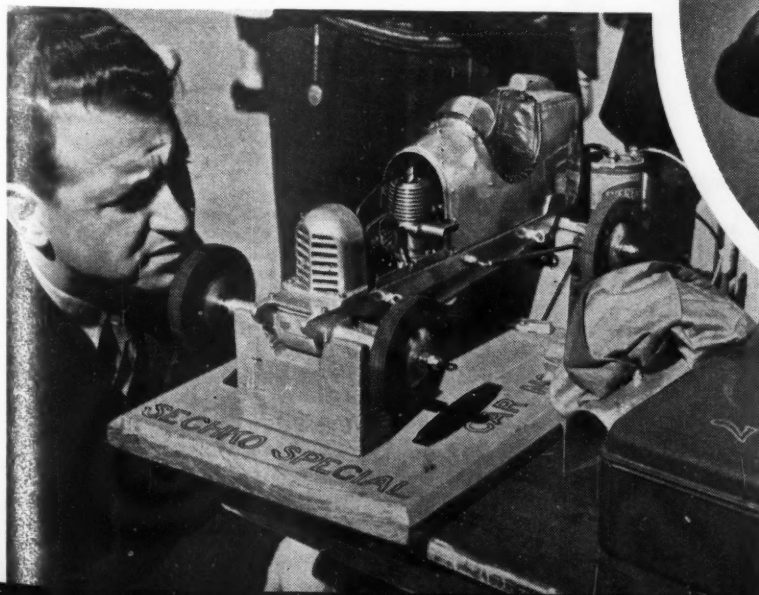


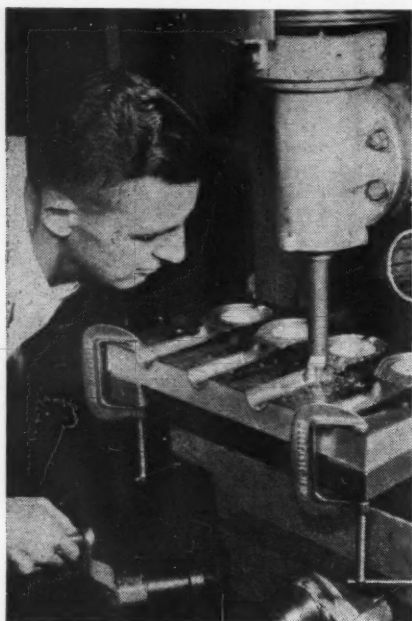
After several trips around the track, this car is about to be timed for six laps. The starter shown at the side is ready to flag to the timekeepers.

## MILE-A-MINUTE MITES

(Circle) One of the better types of miniature cars. Note on its side the two hooks into which are placed the lines attached to the swivel base.

(Below) An interested spectator takes a look-see to find what makes the wheels go 'round. Note the size of the car in comparison with the man.





**Walter C. Suess, metal pattern-maker in the Buick foundry, here is shown operating a milling machine with a high speed head attachment on Dow Metal core box for water pump body core.**

#### Torpedo 8 Choke

It has been found that a change in setting the choke housing cover of the Torpedo 8 Pontiac will improve starting a cold engine and give better engine performance during the warm-up period.

The choke housing cover should be set to four notches rich if there is any tendency for the engine to start poorly or run lean after starting.

#### Servicing Shock Absorbers

On the Series 80-90 Buick an air vent hole plug is provided in the cap over the inertia weight on shock absorbers, which should be removed while filling. Fill through filler hole

# Service Hints

## from

# The Factories

in front side of the shock absorber body. The car bumper should be moved up and down several times to force out any air in the cylinders. More fluid should then be added and the bumper again moved up and down. This process should be repeated until no more fluid can be added.

When filling all series in cases where complaint on shock absorber action is encountered, it is advisable to disconnect the shock absorber arm and move same through its complete up and down stroke. This will give additional assurance that all air is displaced.

#### Clutch Inspection Hole Cover

A singing or buzzing noise under the toe board in a 1939 Pontiac car when it is driven in low gear at approximately nine miles per hour may be caused by vibration of the clutch inspection hole cover. Wedging a piece of rubber, cork or other insulating material between the inspection hole cover and the flywheel housing will stop the cover from vibrating.

#### Oil Leak at Fan Pulley Keyway

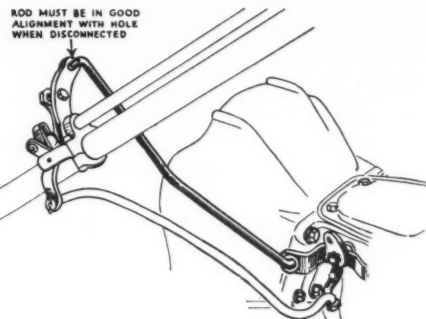
An oil leak at the fan pulley keyway on a 1939 Studebaker Champion indicates that the crankshaft timing gear is not forced to its proper location against the thrust washer on the crankshaft.

To correct an oil leak at this point, make sure that the crankshaft timing gear is tight against the thrust

washer and that the fan pulley is tight against the crankshaft timing gear. This will prevent oil from getting into the keyway.

#### Bind in Shifter Rod— 1939-1940 Models

As the shift lever on the 1939-40 Pontiac cars is moved to select low or reverse gear, the selector shaft moves to the left in the transmission. Sometimes in this position the shifter rod extending from the lever on the steering gear to the lever on the end of the selector shaft may be in a binding position. If this occurs it will be most



noticeable when shifting out of low gear.

To check and correct this condition, remove the shifter rod at the steering gear end and note the position that the rod wants to take in relation to the hole in the lever as the selector shaft is moved out of the transmission case in selecting low gear. Bend the rod so that while disconnected it will drop in the hole in the lever without bind.

#### Garnish Moulding Repair Kit

Garnish moulding transfers, welding fluid, and squeegee are now available at GMPD warehouses. Pontiac Part 983699 Garnish Moulding Repair Kit, listed in Parts Release and Change Notice 136, includes transfers which may be used for repairing the finish of 1936-1937-1938 and 1939 model garnish mouldings.

#### Rear Main Bearing Oil Seal Installation

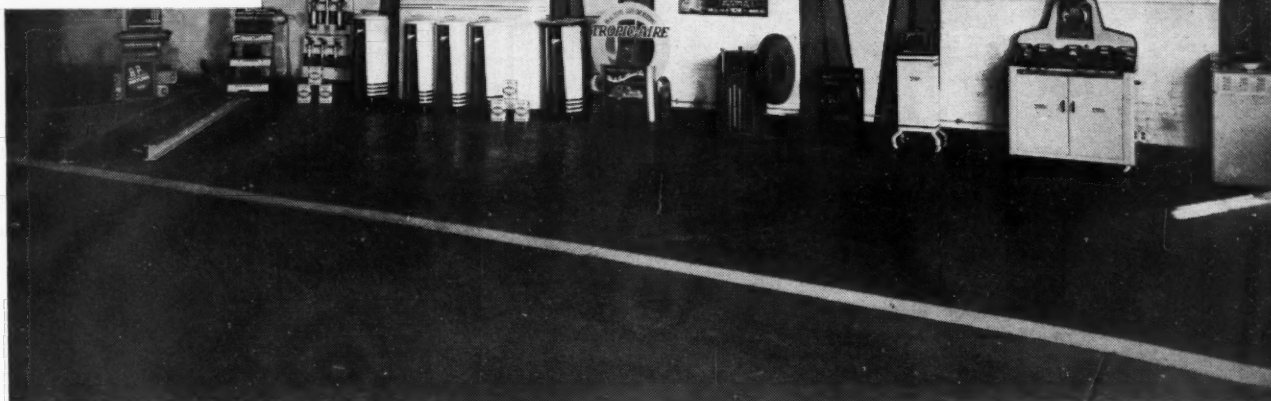
The rear main bearing packing on all 1940 Buick engines, should be cut 3/64 in. above face of bearing to insure a tight fit when assembled.

It is important that engine be operated slowly when first started after new packing is assembled in bearing.



*"You'd better try penetrating oil on that nut first."*





## MOTOR AGE SHOP OF THE MONTH

A big stimulus to business has followed the installation of new analyzing and lubrication equipment at Schell's garage, Dayton, O., in the summer of 1939, according to Managers Bob and Don Schell (Left and right above). This is believed to be Ohio's largest repair garage, devoted exclusively to repair work, not selling new or used cars. Included in the equipment just added are: a motor analyzer; ignition-distributor tester; gas and combustion analyzer; greasing equipment; a hoist, and a wheel balancer. Schell's also have a front end aligner and frame straightener equipment, total equipment investment being around \$6500. The equipment shown in the accompanying picture was installed at a cost of \$2200. Schell's garage, established by Charles Schell 19 years ago has an organization of 19 persons, including six motor mechanics, three in the paint shop, six body men, two in the office, and Don and Bob Schell. This year the firm expects to do an estimated \$75,000, business. Purchases and labor run around \$35,000, said Don Schell. The plant has a 100 car garage, and does quite a storage business.

## THE READERS' CLEARING HOUSE

# Service Men's Queries

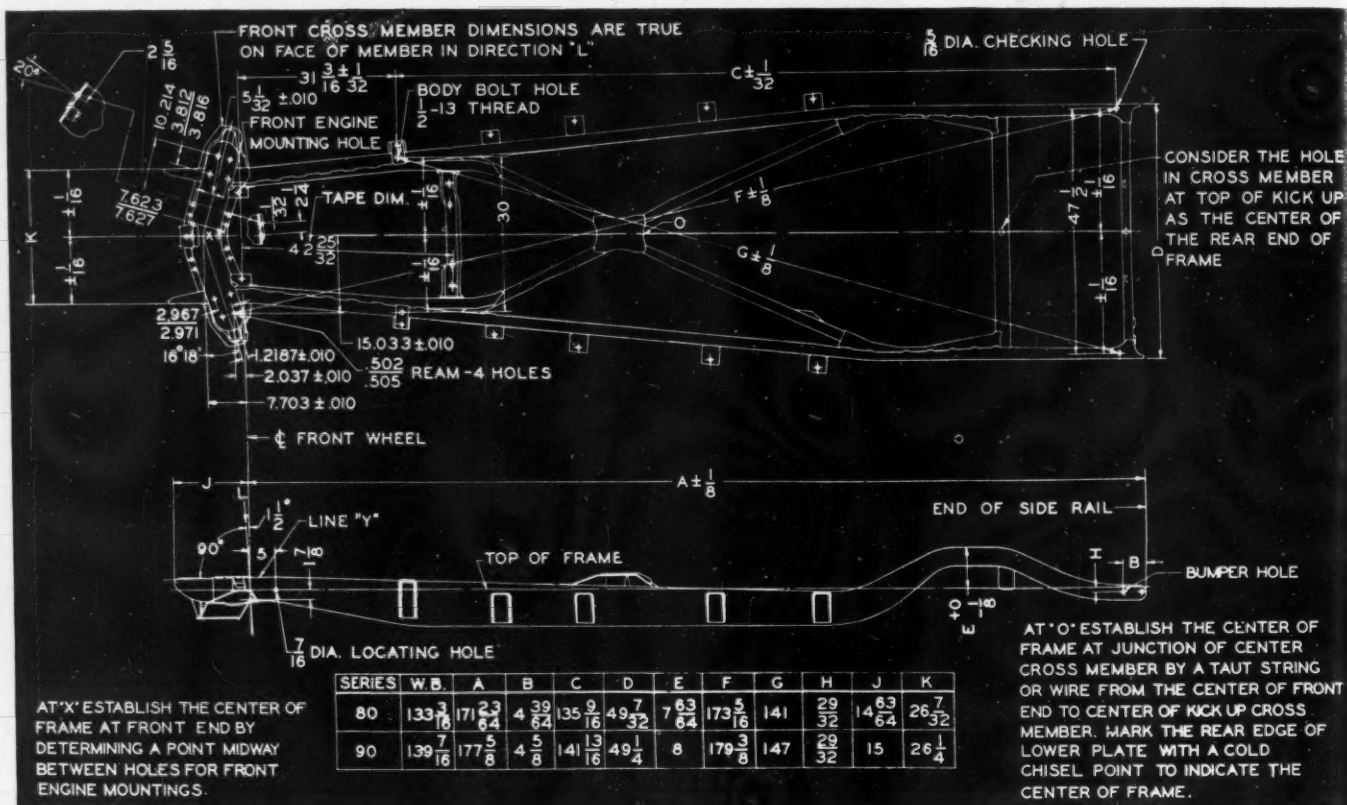
### Too Much Gas

I'm stuck. I've been overhauling carburetors for several years, and apparently doing a fair job. I have factory tools and factory specifications and, up to now, every job has turned out very satisfactorily. The downfall is a Carter 325-S on a '37 Pontiac 6. I overhauled it to correct a percolating

condition, using a Carter repair kit, washing the castings, etc., with thinner and blowing out thoroughly, reassembling and adjusting according to specifications and gages, as per usual. The motor would idle perfectly, but on accelerating would starve on intermediate, but with throttle clear down would take gas all right. I checked and rechecked for proper jets, meter-

ing rod, etc., but to overcome the situation I had to raise the metering rod adjustment a good  $\frac{1}{4}$  in. above gage setting No. T 109-26. Now, although the car seemingly performs satisfactorily, I'm afraid of excess gas consumption, etc. In short, I want to know what is wrong. This trouble did not occur till after the carburetor

(Continued on next page)



1940 Buick Frame Dimensions, Series 80-90

(Continued from preceding page)  
work; in fact, nothing else was disturbed. Thanking you in advance.  
D. V. Naugle, 295 First Cabin Court, Akron, Ohio.

**T**HERE are several things that might be causing the trouble you are experiencing with the Carter 325-S carburetor on a 1937 Pontiac. First of all, there is a strong possibility that the intake ball check which controls the fuel going to the accelerating pump was not replaced in the carburetor or is seating badly. I would suggest that you check to make sure that this ball check is in place and operating correctly.

I would also suggest that you carefully examine the accelerating pump to make sure that it is supplying sufficient fuel for acceleration.

Finally, I would like to point out that Carter supplies three different meter rods for this carburetor, one of them being the standard rod and the other two for leaner adjustments. Possibly you have one of the leaner metering rods, which would cause the effect you describe.

I'm inclined to believe that your trouble is either in the intake ball check or in the use of the incorrect metering rod.

## DRIVE SHAFT VIBRATES

I am having trouble with a drive shaft on a 1938 Dodge Sedan. About a month ago, the rear joint went out. We replaced the joint and now it vibrates when the car is pulling. It

vibrates at all speeds when the car is pulling but when you let up on the throttle, it disappears.

We checked rear springs, rear end, drive shaft—everything that we think might cause it but nothing helps. I would like to know if you could give us some information as to what could cause our trouble. Hollandale Motor Co., Hollandale, Minn.

**I**N reference to the vibration you are experiencing in the 1938 Dodge, it would seem to me that the most likely cause of your trouble is failure on your part to line up the arrow marks on the propeller shaft when you installed it. The universal joints have arrow marks on them which correspond to similar marks on the companion flange which have to be brought into alignment when assembling, otherwise severe vibration will result.

## TRACTOR TIMING

I am having quite a bit of trouble getting a tractor to run right, so am asking you if you can help me.

The tractor is a McCormack-Deering, bought in 1931. Some time ago it began to lose power. The owner had the head taken off and the valves refaced, at the same time reseating the head. This did not help, so he came to me.

We have put new parts in the carburetor, set the ignition according to the marks on the flywheel and checked the valve timing and found it to be on the mark. This did not

improve the power, but the engine starts easily and runs good.

We checked the governors and found that they operated all right. Next we removed the manifold and cleaned it out, and also cleaned the air cleaner.

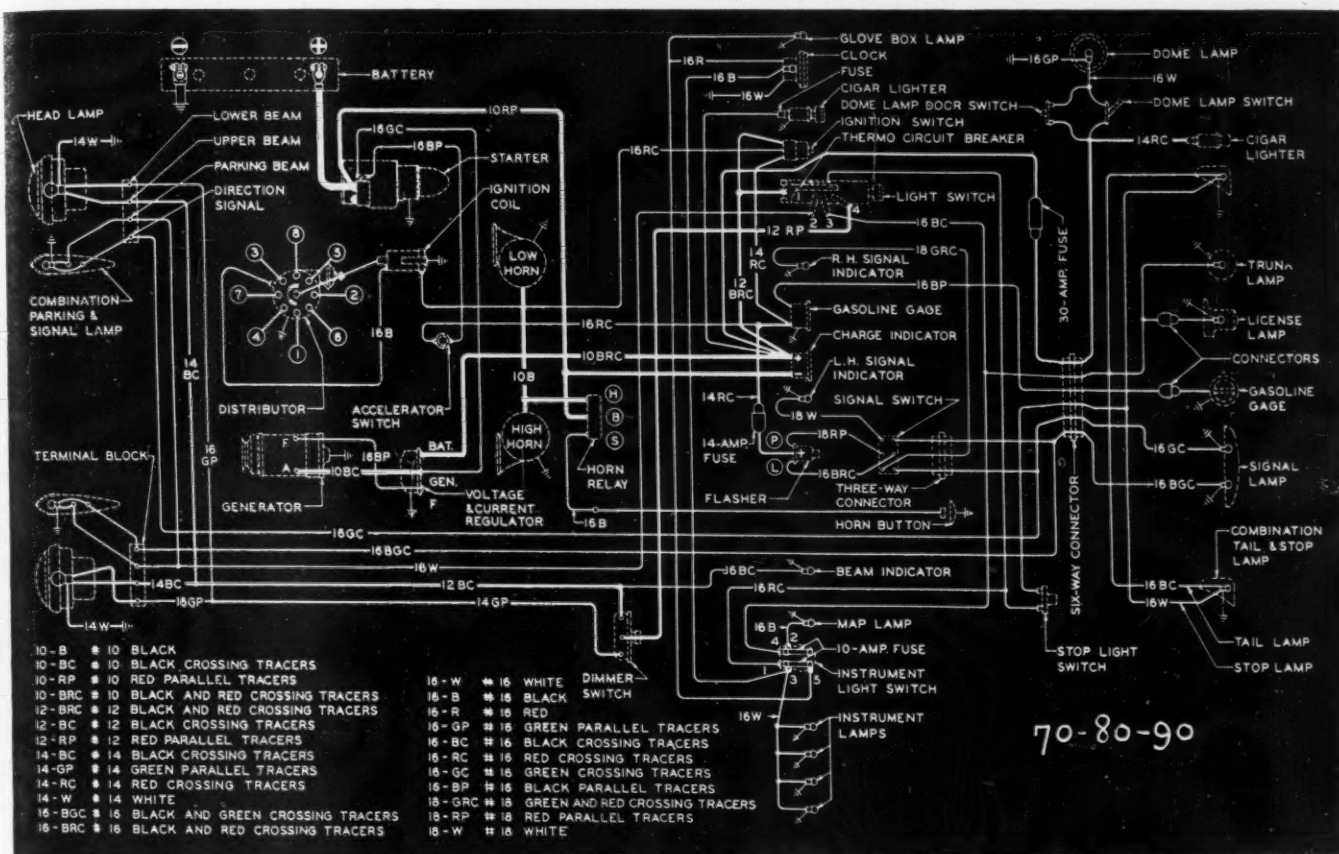
The owner took the head back to the shop where the valves were ground originally, and they did the job over, but when we reinstalled the head the engine had no compression except on three cylinders, and the engine ran worse than before. New exhaust valve guides were next installed, but still no power. Then I ground the valves myself, and got even compression on all cylinders, but when we tried the job out it still had no power. We put in new sleeves, pistons and rings, but this did not help.

What would you suggest? Herman Godbey, Route 5, Salem, Mo.

**I**N reference to the trouble you are having with the McCormack-Deering International tractor, it would seem that you have checked everything but the ignition. From the way you describe the trouble, it would seem that the spark is retarded too far.

In regard to the valves, it is entirely possible that they have been refaced so much that they are too thin and would be apt to cause pre-ignition. But, I don't think that they would cause the difficulty you describe if they had been properly refaced and reseated. In this connection, I would suggest that you check





1940 Wiring Diagram, Buick Series 70-80-90

each of the valves with Prussian blue to make sure that they are seated properly. However, if you now have good compression in each cylinder, it would seem that they are seating fairly well.

In connection with timing the magneto, the breaker points should just begin to open when the DC mark on the flywheel will align with the timing mark on the flywheel housing. When doing this, the impulse equalizer should be locked out and the spark control lever on the dash should be in the retarded position.

You might also check to make sure that there are no leaks in the intake manifold.

I think another point of importance would be the fuel that the owner is using. I would suggest that you take this job and run it with some gasoline of your own that you are sure is O.K.

## STUCK NEEDLE VALVE

*I have been having trouble with a 1935 Ford V-8 with a Stromberg carburetor. The float valve sticks shut and won't let the gas in. This condition occurs after the car has been standing for an hour or so.*

*I have always used a good grade of gasoline but never had any trouble till now. The float height is 15/32 in. and the pump delivers 2 1/2 lb. pressure. The engine empties the carburetor bowl and the pump will not feed it again unless you tap on the side of the carburetor.*

*I tried a new carburetor but it did the same thing after a few weeks but the valve sticks shut in it too, so I don't know what to do next. I drained the water off the bottom of the tank but it didn't help.*

*It has us all stumped here at the garage. I was wondering if there was a different kind of valve I could get for this same carburetor. Lester Sheets, 110 S. 5th St., Decatur, Ind.*

**I**NASMUCH as you have already tried another carburetor on that 1935 Ford V-8, it would hardly seem that the trouble is in the float needle valve. And while you might try installing another needle valve rather than the complete carburetor, I hardly think that it would overcome your trouble.

I am inclined to believe that your trouble is caused by the use of old or stale gasoline which has a tendency to form gum which would cause the effect you describe.

I would suggest that after thoroughly cleaning the float needle valve that you drain the entire fuel system including the tank and then refill with gasoline from a station that does a big business so as to insure getting new gasoline.

You might also try installing a thick asbestos gasket between the carburetor and the manifold so as to reduce the amount of heat reaching the carburetor. This gasket should be about 3/8 of an inch thick. Also, when tightening the coupling up on the fuel

line where it connects with the carburetor, be careful not to apply too much pressure which might tend to distort the needle valve seat.

## OIL TROUBLE

*I have a 1937 Ford 85 with steel pistons—not slipper type—and have done the following: Installed new inserts, valve guides and new rings and still it uses a quart of oil every 150 miles.*

*I put in the first set of rings and no inserts or new guards, then I did the job over and installed all the above parts and still no results.*

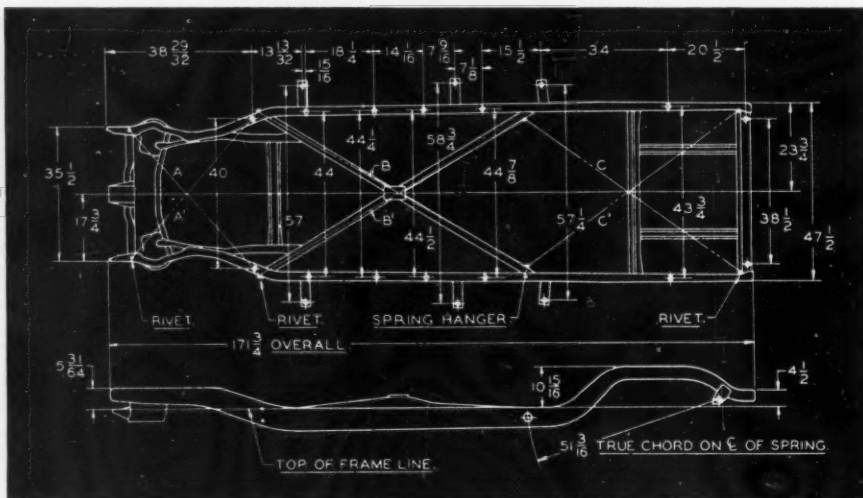
*Is there any way to saw these pistons and use an expander? Earl E. Redfoot, Wagner's Body Shop, 179 S. Mercer St., Greenville, Pa.*

**C**ONSIDERING all the work you have done on that 1937 Ford, it would seem to me that the oil can't be getting past the pistons and rings unless the cylinders are in very bad shape and, consequently, must be leaking out.

I would suggest that you make an oil pressure test on this job just to make sure that the mains and camshaft are not leaking excessive oil.

There is a possibility that your oil pan has become sprung so that it no longer compresses the packing at the rear of the case sufficiently to prevent oil leakage. I suggest that you re-

(Continued on next page)



1940 Pontiac Torpedo Eight Frame Dimensions

(Continued from preceding page)  
move the pan and check the cork packing at that point so as to make sure that it is compressed by the pan along the entire surface.

However, if this job is actually burning the oil so that a smoke exhaust results—it is a cylinder and piston condition. I do not think that you will get anywhere by splitting the pistons but you might have them tin plated or, if the wear is extreme, it might be necessary to recondition the cylinders and install new pistons.

### STARTER ENGAGEMENT

I am having trouble trying to get the starter engaged on a 1939 Buick. As you know, the starter on this car is hooked up with the accelerator pedal and when you depress the throttle the starter will not engage. When I short the terminals of the car starter, the starter will crank the engine. When you depress the accelerator it does not seem that current is passing through the automatic unit.

Can you please tell me what to do to overcome this trouble? W. F. Keckefoth, Keckefoth Motor Co., 111 E. 2nd Street, Winona, Minn.

IN order to lick the trouble you are having with the 1939 Buick starter circuit, I would first make sure that all electrical connections at the ammeter, ignition switch, vacuum switch, battery, starter and starter solenoid relay are clean and tight and that there are no broken wires in the starter switch circuit.

Then, I suggest you isolate the trouble by making the following simple tests: First, put a "hopper" wire across the contacts of the vacuum switch. Now try the starter. If starter functions, it indicates a defective vacuum switch. If starter does not operate after this test, try the solenoid relay as follows:

Remove hopper wire from the vacuum switch and have someone hold the solenoid relay points closed. Again try starter. If starter will operate, a defective relay is indicated. If

starter fails to work, make both tests together—that is, put the hopper on the vacuum switch and hold the relay points closed. A defective solenoid is probably the trouble.

A quick test of the solenoid can be made by clipping a test lead to any "hot" wire (the Bat. terminal of the generator cutout relay will do nicely) and touching the other end of the test lead to the stationary point of the starter solenoid relay. If solenoid is operating properly, the starter will immediately function. Complete test for starters, solenoids relay and vacuum switches is given on page 123 of the 13th edition of the CHILTON FLAT RATE & TUNE-UP MANUAL.

### STATIC

I have taken MOTOR AGE for over fifteen years and never fail to read your Service Men's queries. Somewhere in your answers I have seen about cars that have static and your cure for them, but cannot find it and have forgotten what the remedy is. So will you please tell me?

I have a 1939 Buick, Model 40, which after you drive a while and get out and touch the car you get a shock from static. Will you please tell me how I can overcome it. William Marten, Marten Garage, Beatrice, Neb.

GETTING rid of static charges in an automobile is very often quite difficult. Of course, you can always attach a small flexible chain to the underside of the frame and have it drag along the ground. This, as you know, is the method used by gasoline companies in protecting their tank trucks. However, most passenger car owners would find that objectionable.

In general, there are three points to check in trying to reduce the effects of static. First of all, the brakes should be carefully adjusted so as to make sure that the shoes are not dragging. Secondly, you can install what are known as static eliminators in the hub caps. These static eliminators connect the ends of the axle shafts or wheel spindles to the hub of the car. The third point is to use powdered graphite in the tire casings in order to reduce friction between the casing and tube.

These three things will generally eliminate or at least materially reduce the amount of static. However, as I said before, the only sure way is to attach a small chain to the underside of the chassis and have it drag on the ground.

### BEARING LEAK

We have a 1934 Pontiac 8; motor in excellent condition; it has a new rear main bearing which fits perfectly and a new plug at end of cam shaft. At 45 miles per hour it does not leak a drop of oil by flywheel, but at over 45 it leaks a stream.

Have tried running motor with



"This is the creeper I was telling you about!"



filler cap off, as we thought it might be building up pressure inside, but that does not help. Can you give us any suggestion of something we can do? Thanks. Mokren Bros. Garage, LaGrange, Ohio.

**I**N reference to the leak at the rear main bearing in your 1934 Pontiac 8, I would suggest that first of all you make a careful check to make sure that the ball check is free to move and seats properly. If you find that the ball check is in good condition, the only thing I can see is that the main bearing journal has become worn to such an extent that it requires regrinding. In this connection, I would suggest that you make an oil-pressure test to see just where the oil is going. From this test you will be able to determine just what parts are defective, and what would be necessary to recondition them.

## TRANSMISSION NOISES

As soon as the car has developed momentum—say around 20 m.p.h.—and the labor of getting the car under way has been relieved, a noise develops in the transmission of a 1937 Pontiac Six which is quite apparent up to 50 m.p.h., when it seems to be more or less absorbed by routine traffic noises. The noise is similar to that of a dry gear, or a floating gear which is idling and performing no work at the moment.

The noise is at a maximum when the car and motor are operating at approximately the same speed or when decelerating.

The noise may be increased or decreased by exerting pressure on the shifting lever in any direction, but there seems to be no neutral point at which the shifting lever may be placed to completely eliminate the noise. In a certain spot the noise will nearly cease, but when relieved the lever drifts back to a point where the noise is greater.

A change to a new lubricant produced no change.

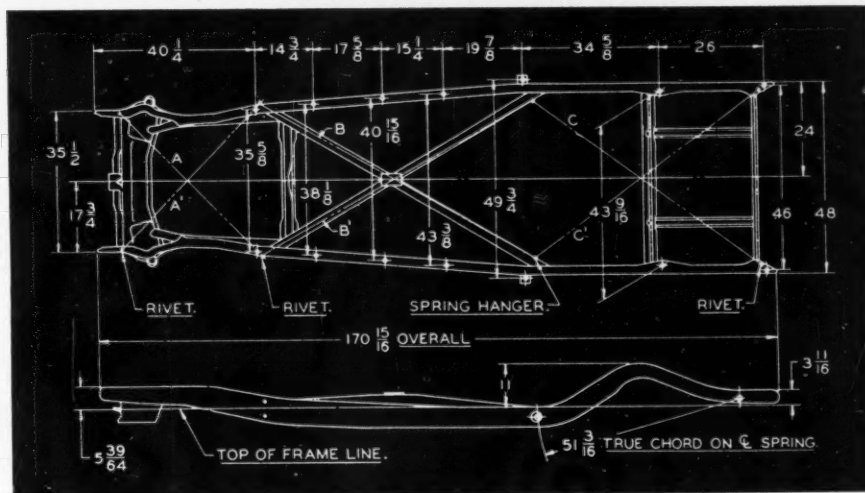
At times it is very difficult to shift into second—other times very difficult to shift into high.

Throwing out the clutch seems to make no difference in the noise—however, neutralizing the lever reduces the noise but does not eliminate it.

Warm or cool weather—dry or wet pavement—the condition is the same. Lerkins Garage, 16 Davis St., Geneva, N. Y.

**F**ROM the description you have given of the trouble that you are experiencing on that 1937 Pontiac transmission, it would seem to me that there is quite a strong possibility that some of the snap rings or detent springs have become broken.

In addition, when you have the transmission down, I would make a careful check of the synchronizing drums and also the gears, particu-



1940 Pontiac DeLuxe Six and Eight Frame Dimensions

larly those on the main shaft. Also make sure that spacing washers are not worn, as a resulting excessive end play would also cause the trouble you are experiencing.

## HARD STARTER

Here I am again. I am stuck on a 1938 G.M.C. truck, using it for a school bus. It will not crank on a cold morning but it will start if you pull it about 50 yards. I have installed new coil, new condenser, new points. All this did not do any good. Three weeks ago, I put in a set of new plugs, and that seemed to cure the trouble, but it's back just like it was. The truck started this trouble before it was driven 3000 miles and I cannot find anything wrong. If you can help me cure this trouble, I sure would thank you a lot, for I am really stalled. Mr. J. D. Hardy, Prop., Ecru Motor Co., Ecru, Miss.

**F**IRST thing I would suggest that you try on your G.M.C. truck, would be a lighter oil in the crankcase. Unfortunately, you did not state what oil you are using, however, I would suggest that you try S.A.E. 20W, and see if that doesn't make the

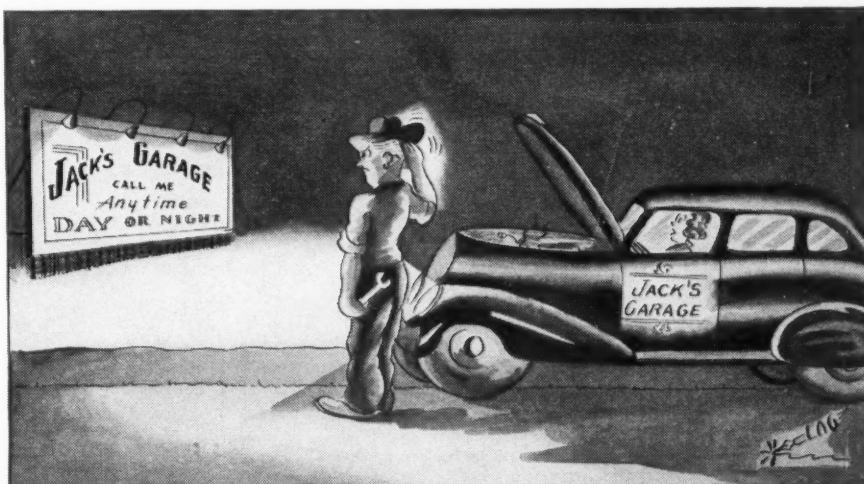
truck start easier in cold weather.

I think it would pay to try a larger storage battery, that is, a battery with a greater number of plates in each cell. As you know, it often happens that while the battery is strong enough to crank the engine, it has not enough power left to produce a good spark. Installation of a larger battery should overcome the trouble if that is the case. You might also try reducing the spark plug gaps to 0.020 in.

In making these suggestions I have, of course, assumed that you have good compression in each cylinder and that the carburetor is in good condition, and that the distributor and breaker points are o. k.

## DISTRIBUTOR LEAKS OIL

I have a '38 standard Chevy that leaks oil around the bottom of the distributor. The oil pumps up the shaft and comes out the vent holes on the bottom. At first, I thought it was the shaft that was out of line, so I put in a new shaft, but this didn't stop it. So I took it out again and made sure that the return hole was open and checked the up and down (Continued on next page)



(Continued from preceding page)  
*play. It had some up and down play, so I put shims in and eliminated that. It had no side play, the bushings are good and the oil hole is open. What can I do to stop the oil leak? Don Hollingshead, South Side Service Station, Archbold, Ohio.*

**S**OME of the early 1938 Chevrolets did not have the inside of the distributor housing grooved to facilitate the return of oil to the crankcase. I would suggest that you check your particular car, and if the housing is not grooved, secure a new part from your local dealer and I think your troubles will be overcome. On the other hand, if the housing is provided with grooves, your trouble is quite possibly caused by excessive oil pressure, which can be overcome by installing a new oil pump driven gear shaft.

### PERCOLATES

*A 1933 Terraplane won't start when hot. Can its carburetor be fixed so it doesn't percolate, which is what I suppose is wrong? How?*

*The Case tractor governor trouble which you said was crooked shaft or loose gear, was right. It was crooked shaft on one and loose gear on the other tractor. But the crooked shaft was caused by a governor weight axle slipping out and being forced through the housing while engine was running. These governor weight axles have cotters on each end. The cotters soon cut off when axle gets loose in governor weight. E. W. Symms, Cherokee, Oklahoma.*

**I** CERTAINLY was glad to hear that the suggestions we made that might be the cause of the trouble with the Case tractor worked out O.K.

On your 1933 Terraplane, if the trouble is vaporlock, you can reduce

this materially by installing a thick asbestos gasket between the carburetor and the manifold. This gasket can be built up of several layers of sheet asbestos so the total thickness is approximately  $\frac{3}{8}$  of an inch.

If the fuel line comes close to the exhaust line at any point, it is advisable to shift the fuel line to the other side of the chassis.

It is also necessary at times to install a shield so as to keep the heat away from the fuel pump.

Incidentally, sometimes coil troubles will only show up after it is hot, and I suggest that you check the coil in addition to the carburetor.

### BURNING POINTS

*I would like to know why interrupter points burn out so often. I put a new pair on each month. The coil and condenser are O.K. This truck is a 1938 Studebaker, Serial No. K15-029, motor No. L.T. 22083. Wm. C. Whittier, 38 Military Street, Houlton, Maine.*

**T**HERE are several reasons which would cause the breaker points to burn out so frequently on your Studebaker truck. Assuming that the condenser is in good condition, the most likely cause is high voltage. This can be caused by high resistance to the charging circuit of the battery, and in that connection, I would suggest that you carefully check the generator, generator connections, the battery, battery connections, and also the current control unit, whatever type it might be. In some cases I have found that cars or trucks equipped with heavy duty coils had similar trouble. This is caused by the fact that the coils, drawing an excessive current, resulted in extreme arcing at the breaker points.

A battery in poor condition would also sometimes result in high voltage

which will result in burning out of headlights, and burning out breaker points.

### COLD TAPPETS

*The valve tappet settings which you give in the Flat Rate Book are for warm or hot settings in most all cases. Is it possible to determine a cold setting instead, as some cars cannot be set without a considerable amount of dismantling, and by the time this work is done and the last valve is set, the engine is already cold again? E. K. Irvine, E. K. Irvine Garage, 6907 Duncan Ave., Tampa, Florida.*

**I**N reference to the valve tappet settings, I appreciate, of course, that it is quite difficult on most of the modern cars to set these with the engine warm. However, the car factories generally supply the specifications in that way and there is no method whereby these settings can be converted to cold settings.

However, most mechanics adjust these tappets with the engine cold by simply adding .001 inch to the setting specified for the engine warm.

I know that every engine I have checked that has been set in that manner has worked out satisfactorily.

### ENGINE MISS

*I've been working on a 1933 DeSoto that keeps fouling plugs, skipping from one to the other. I have tried three different brands of spark plugs in this car and they all do the same way within a week's time. The car doesn't use an excessive amount of oil, nor are the plugs very dirty but they won't fire. I've used the plugs specified by chart recommendations. Please tell me what is wrong. Irvin's Shop, Wagoner, Okla.*

**T**HERE are several points which might cause the trouble you are experiencing on a 1933 DeSoto besides the spark plugs which you have already checked. I would suggest that first of all you check the distributor shaft bushing and if this is worn, it should be replaced.

As a temporary cure, you might ground the distributor housing directly to the frame of the car. Also, make sure that the ground strap from the engine to the frame is making good electrical contact. The condenser should also be checked and the distributor cap should be checked for leakage.

The ignition cables—both primary and secondary—should also be checked to make sure there are no poor contacts nor leaks.

To return to the distributor cap, make sure that the contact towers are clean and not corroded so that they make good electrical contact with the secondary wires.



"The Admiral wants his chains put on!"



(Circle) Henry and Edsel Ford (left and right) with Harvey Gibson, chairman of the New York World's Fair for 1940, as they signed up for the exhibit this year. Edsel Ford said he and his father were delighted with the results their company obtained at the fair last year and that they believed the opportunity in 1940 would be still greater. The Ford exhibit, one of the most popular at the fair, attracted millions of visitors this past summer.



(Below) Race driver Bob Swanson apparently forgot he was off the track when he drove 60 m.p.h. through a Hollywood, Cal., intersection. His speed was cut short suddenly by a traffic policeman and here he is shown at the Hollywood jail tinkering with an ambulance while serving a 30-day sentence behind the bars.



(Right) Al Pearce, radio comedian, is causing Hollywood to stare with his new Scarab car. It is one of only two in this country. The rear-engined car is supported on air-cushion compartments instead of springs. The interior is much more roomy than the average car and is equipped with a table and two extra movable seats. The spare tire is housed forward in the space occupied by the engine in ordinary cars.



(Above) Ronald Rubel, a mechanic of Buckeye, Ariz., drives a few nails to balance one tip of the wing on his home-made plane. For 10 years Rubel stood the jibes of his friends as he built this plane. He stepped up a two-cylinder engine to 38 h.p. after casting pistons for it of his own design. The plane is reported to fly 80 m.p.h., getting up to 40 miles per gallon of fuel.



## Boost Qualifying Time for Indianapolis

### Speedway Management Sets 115 m.p.h. as Minimum Speed

Increased speeds are forecast at the Indianapolis Speedway this year in line with requirements of the entry blanks for the 28th annual 500-Mile International Sweepstakes, now in the hands of drivers in the United States and in European countries. However, it is doubtful that any of the foreign drivers will venture onto the high seas in view of the present war.

Heralding further increase of the sensational speeds turned in during 1938, the speedway management has set 115 miles per hour as the minimum gait any entrant may attain in qualifying for the 33 starting positions of the Grand Prix event May 30. The minimum speed allowed last year was 110 miles per hour.

The 1940 entry blank stipulates that each car must show an average speed of 115 miles per hour in the official speed trial of four laps of the two-and-one-half-mile speedway. The fastest qualifying average for the 10 miles in preparation for the 1938 race was turned in by the late Jimmy Snyder. Snyder, who died after the Indianapolis grind in a midget race, qualified at 130.138 miles per hour, a new all-time record for the time trials. His fastest single lap during qualifications was 130.757 miles per hour.

New records were turned in all along the line up to and including 250 miles. But when accidents slowed the race in the final stages, the 500-mile gait of Wilbur Shaw, the last-

minute winner, fell below the existing record of 117.200 miles per hour for the 500 miles. That mark was set in 1938 by the late Floyd Roberts.

Snyder's existing record for the 250 miles at Indianapolis is listed by the AAA Contest Board as 120.893 miles per hour.

Other revisions in the 1940 entry blank, which calls for continuance of the International Formula of Rules first adopted in 1938, are:

The Technical Committee has withdrawn its recommendation that fuel tanks not be constructed for a capacity exceeding 30 gallons. The new blank does not mention fuel tank capacity and makes no restrictions.

Tightening restrictions on tire ring link locks, the new blank adds the specification: "Balancing lugs for wheels and tires must be approved by the AAA technical committee. No lugs of more than two inches in length will be permitted and lugs must be securely fastened." The specifications formerly stipulated that "Wheels may be required to be equipped with an approved tire ring link lock."

Practice of some drivers making last-minute changes in the names of their cars when changing from one sponsor to another is outlawed in the new entry blank. Changes in names will not be allowed after May 20.

All entries must be postmarked not later than midnight, May 1. Each entrant is required to post a \$125 entry fee, of which \$100 will be re-

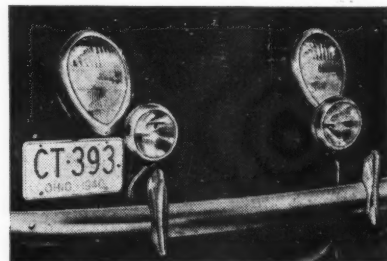
funded on each car which attempts to qualify.

The prize purse guaranteed by the speedway management is \$50,000, of which \$20,000 is allotted to the winner. With accessory prizes and lap monies yet to be announced, it is expected that the total purse will amount to \$100,000. Each car that starts the race is guaranteed at least a consolation prize of not less than \$500. Consolation awards usually amount to not less than \$750.

In line with rules of the International Formula, competition is open to non-stock supercharged motors of 183.060 cubic inches piston displacement or less, and non-stock non-supercharged motors of 274.59 cubic inches piston displacement or less. Weights are regulated according to the size of the piston displacement.

## G.E. Announces Sealed Supplementary Headlights

Development of two new all-glass sealed headlamps designed expressly for use on front bumpers of all 1939 autos and cars of prior make has been announced by General Electric Lamp Department, Nela Park, Cleveland, Ohio. The new lamps are 5 in. in diameter as compared to the 7-in. width of the Sealed Beam headlights, and are rated at 35,000 candlepower. One light, called the "sealed driving lamp," produces a symmetrical beam



like the country beam from Sealed Beam lamps, and is intended to supplement the light from upper beams of cars 1939 and older. The other light, called the "sealed passing lamp" is equipped with a lens which throws the light along the right side of the road without creating glare for approaching drivers. It is designed to supplement the "passing beam" from the headlights of those past model cars.

The sealed driving light can be wired to come on with the country beam of the regular headlights, and the passing light can be wired to come on with the passing beam of the regular headlights. Each lamp can be wired through a switch clamped to the dash to permit the driver to turn the lamp off when the car is being driven on lighted city streets.

## Exide's Gay Retires

H. B. Gay, third vice-president and general sales manager, also a member of the board of directors of The Electric Storage Battery Co., retired from active service on Dec. 1, 1939, after 38 years in the employ of the company.

## BATTERY LOCATION CHART FOR 1940 CARS

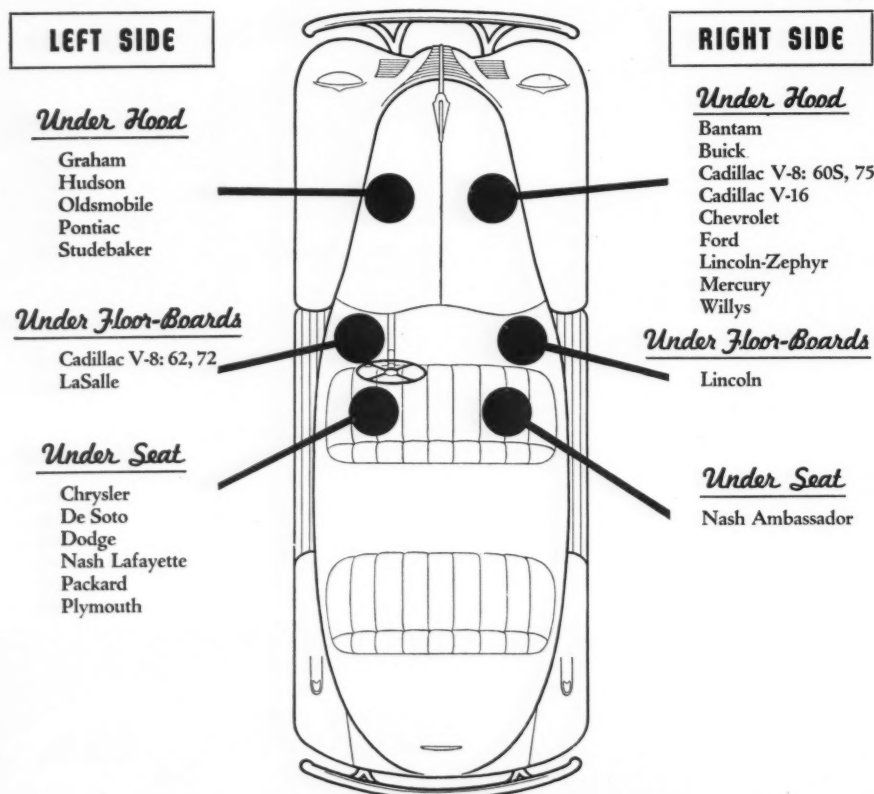


Chart supplied through courtesy of Electric Storage Battery Co.



## Seventeen Drivers Set Sixty-nine Speed Records

Seventeen drivers shared honors in establishing 69 new speed records for various distances on tracks and auto racing speedways throughout the United States in 1939.

The Contest Board of the American Automobile Association credited Joie Chitwood with 19 records to lead the pace-setters. The late Jimmy Snyder, who died in midjet racing competition after the Indianapolis race, was credited with nine records for second place. Each of Snyder's marks was set in the International 500-Mile Sweepstakes at Indianapolis on May 30. Ted Horn, Indianapolis headliner, was rated third with eight records.

Seventeen of Chitwood's records were established on half-mile tracks and two were written into the records at the 1½-mile Altoona (Pa.) Speedway, formerly a board track.

Other record-breakers of 1939 and the number of new marks they established were: Mark Light, 6; Walt Brown, 5; Tony Willman, 3; Buddy Rusche, 3; Vic Nauman, 3; Wilbur Shaw, 2; Rex Mays, 2; John Ulesky, 2; Duke Nalon, 1; Babe Stapp, 1; Mike Little, 1; Eldridge Tadlock, 1; Rex Records, 1; Lee Wallard, 1; Paul Young, 1.

Following are the new records for various distances on the Indianapolis Speedway established in 1939, according to the AAA compilation.

Distance	Driver	M.P.H.
*2½ Mi. (1 lap)	Jimmy Snyder	130.757
*10 Mi.	Jimmy Snyder	130.138
2½ Mi.	Jimmy Snyder	120.208
5 Mi.	Jimmy Snyder	123.165
10 Mi.	Jimmy Snyder	124.031
25 Mi.	Jimmy Snyder	124.517
50 Mi.	Jimmy Snyder	123.553
100 Mi.	Wilbur Shaw	123.441
150 Mi.	Wilbur Shaw	123.425
200 Mi.	Jimmy Snyder	120.996
250 Mi.	Jimmy Snyder	120.893

\*Established in qualifying trials; all other records established during 500-mile race.

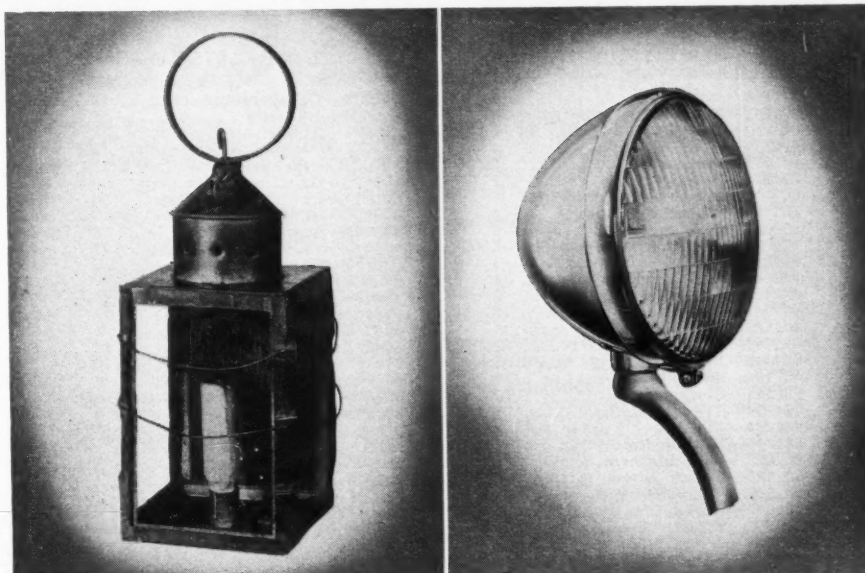
## Pittsburgh Plate Glass Offers Pump Deal

The paint division of the Pittsburgh Plate Glass Co., Grant Building, Pittsburgh, Pa., has developed a new pump to assist in mixing Mimax and Lavax with thinner. The pump fits the standard opening of a five gallon container and delivers two ounces of thinner with each stroke. This pump is not offered for sale but is given free as a part of a special plan developed by the company. Details of this plan will be furnished upon request.

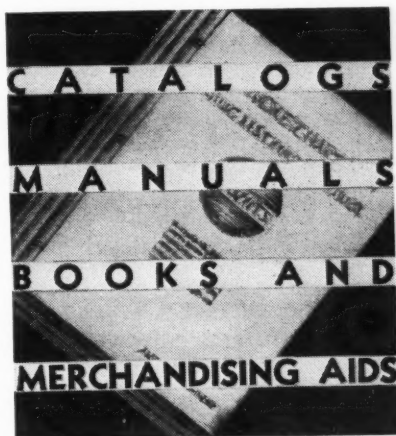
## Perfect Circle Sales Continue at Record Level

According to a statement released by Don H. Teetor, manager of replacement sales of the Perfect Circle Co., more Perfect Circle piston rings were sold for replacement in the first ten months of 1939 than any other similar period in its history. An analysis of sales figures showed that in the first ten months of 1939 total ring sales were 50 per cent ahead of the same period in 1938.

## Dietz Celebrates 100th Anniversary



"Tippecanoe and Tyler Too" was the colorful rallying cry which stirred Americans in the presidential campaign of 1840. Then the United States was relatively an infant among the nations of the world. An infant, too, was R. E. Dietz Co. which first saw the light of day in New York—one hundred years ago! When the first Dietz lantern was produced, young America was just welcoming the beginning of the era of great Clipper ships—a far cry from the giant ocean-spanning Air Clippers of today. And the first Dietz lantern was a far cry, too, from the 1940 product of this company. The square type candle lantern of more than a century ago, shown above, is in the Dietz collection of lanterns old and new. It indicated a break with the past and, to some extent, set the stage for the open type lantern to come. Latest in the Dietz automotive line is also shown above—the new sealed beam driving lamp. "Gasoline buggies" were fitted with Dietz lamps as far back as the turn of the century.



A new book by Hobart Bros. Co., Hobart Square, Troy, Ohio, lists the complete line of welding accessories and electrodes manufactured by the company. This is a 20-page booklet, and will be sent without charge upon request.

The annual publication of the handbook of Truck and Trailer Sizes and Weight Restrictions is now ready for distribution to any truck operator or official dealing with the road laws. It is compiled by The Four Wheel Drive Auto Co., Clintonville, Wis., who will be pleased to receive requests for copies.

A new hydraulic brake parts catalog is now ready for distribution by E. Edelmann & Co., 2332-56 Logan

Boulevard, Chicago, Ill., listing the complete line of hydraulic brake parts for passenger cars and trucks. Passenger car listings are separate from truck listings, there is a complete numerical listing for parts and one for kits, and a conversion table to speed up the finding of parts numbers when only the car makers' or manufacturers' numbers are known.

The Wagner Electric Corp., 6400 Plymouth Avenue, St. Louis, Mo., announces the addition of another merchandiser to its growing list of hydraulic brake parts and fluid trade helps—the Wagner Lockheed Fluid Display Merchandiser for 3-oz. cans. It is a counter display made of heavy cardboard, holds 12 3-oz. cans of Lockheed Fluid No. 21, is very attractively designed. The 3-oz. can serves as a one-shot refill in bringing master cylinders to the proper level, and makes it possible for the filling station and repair shop to sell a sealed can of Lockheed Fluid No. 21 to the car owner.

Recognizing the importance of adequate power supply to satisfactory car performance, the National Battery Manufacturers Association, 2706 First Central Tower, Akron, Ohio, have published a 16-page booklet entitled "Why Penalize the Performance of the Modern Car with an Undersized Battery?" This book lists in table form current requirements of all accessories and contains other valuable information.

(Continued on page 64)

# PARTS NUMBERS AND PRICES

## Pontiac Model 40-28HA DeLuxe-8 Cyl.-1940

FRONT SUSPENSION			ENGINE PARTS—continued			ELECTRICAL SYSTEM		
Part No.	No. Used	Price	Part No.	No. Used	Price	Part No.	No. Used	Price
503576—Knuckle .....	2	\$6.50	502816—Compression ring ..	16	\$0.30	1110804—Distributor assem...	1	\$10.00
410915—Knuckle support, L. .	1	5.00	498.04—O.I. ring .....	8	.50	1837494—Distributor cap ...	1	1.50
503577—King pin .....	2	.85	494998—Piston pin .....	8	.55	1116021—Dist. vac. control...	1	1.25
503575—King pin bushing ...	4	.25	49.991—Piston pin bushing..	16	.15	1871870—Contact set .....	1	.80
230679—Pin thrust brg. ....	2	.50	487461—Pin set screw .....	8	.05	1836893—Rotor .....	1	.30
230857—King pin lock pin ...	2	.15	499625—Con. rod, less brg. .	8	2.75	1869704—Condenser .....	1	.40
504058—King pin repair kit. .	1	3.20	500011—Con. rod bearing ...	16	.50	1115126—Ignition coil .....	1	3.25
231760—Upper arm pin .....	2	.50	499608—Inlet valve .....	8	.60	1116286—Ignition switch ...	1	1.25
500863—Pin bush, threaded. .	2	.40	499609—Exhaust valve .....	8	.85	1995009—Lighting switch .....	1	1.25
1298827—Pin bushing plain. .	2	.35	499618—Valve spring .....	16	.15	1997725—Stop light switch..	1	.30
411817—Pin bushing seal .....	4	.03	526795—Valve spring cage ...	16	.10	820052—Starter switch .....	1	.75
410945—Support arm low, L. .	1	5.00	499598—Valve spring seat ...	16	.06	1997003—Dimmer switch ...	1	.65
412107—Lower arm pin .....	2	.60	499599—Valve key .....	32	.05	857886—Tell-tale light .....	1	1.80
411147—Lower arm pin bush. .	2	.50	495462—Inlet valve guide ...	8	.25	1102665—Generator assem...	1	21.50
411382—Low. pin bush, seal. .	4	.05	494876—Exhaust valve guide .	8	.25	1878209—Generator brush ...	2	.15
411144—Low. arm shaft .....	2	2.25	504227—Valve lifter .....	16	.60	1879002—Gen. armature ...	1	*5.00
411145—Low. arm shaft bush. .	4	.40	392167—Valve adj. screw ...	16	.10	3203—Drive end bearing ...	1	1.15
411146—Shaft bush, seal .....	4	.10	495149—Timing chain .....	1	4.50	1878427—Gen. field coil, L...	1	1.20
502841—Coil spring .....	2	5.00	499604—Crankshaft sprocket .	1	1.50	1118201—Voltage regulator ...	1	6.50
264939—Tie rod & ball .....	2	1.50	503454—Camshaft sprocket. .	1	1.25	1107914—Starter assembly ...	1	22.50
264924—Tie rod adjuster .....	2	.25	MAIN BEARINGS			1857960—Starter brush set..	1	.30
264944—End assembly, L. ....	1	2.00	500003—No. 1 .....	2	.70	1867897—Starter armature..	1	*4.50
502023—Knuckle arm, L. ....	1	1.80	500004—No. 2 .....	2	.70	820153—Field coil, up. ....	1	1.60
502125—Front wheel, prime. .	2	9.00	500006—No. 3 .....	2	.60	1873789—Starter clutch ...	1	3.50
501998—Front hub & drum, L. .	1	9.00	500007—No. 4 .....	2	1.20	504443—Headlamp assembly. .	2	11.00
909001—Wheel bearing out. .	2	1.95	500009—No. 5 .....	2	.80	925000—Sealed beam unit... .	2	1.35
909552—Wheel brg. cone in. .	2	1.25	ENGINE OILING			924565—Headlamp door .....	2	1.25
909602—Wheel brg. cup in. .	2	1.15	498832—Oil pump assem. ....	1	6.00	927023—Rear lamp, L. ....	1	2.75
909702—Ball assembly, in. .	2	.80	495012—Pump shaft & gear. .	1	1.50	927055—License lamp .....	1	2.00
504332—Grease retainer .....	2	.25	497232—Pump drive gear .....	1	1.50	916993—Fender lamp, L. ....	1	2.50
503581—Hub cap .....	2	1.30	525093—Pump idler gear .....	1	.90	5270316—Bat. switch cable. .	1	.90
STEERING			498821—Relief valve spring..	1	.05	5271257—Bat. ground cable. .	1	.50
265207—Drag link .....	1	1.75	CLUTCH			FRAME and BODY		
264946—Ball seat .....	4	.15	503784—Housing .....	1	10.50	(4 door sedans in prime)		
335976—Seat spring .....	2	.20	503466—Release brg. assem. .	1	1.65	503663—Front fender, L. ....	1	22.00
265908—Pitman arm .....	1	1.75	502559—Disk & facing .....	1	6.90	502456—Rear fender, L. ....	1	9.20
264953—Idler arm .....	1	1.00	503204—Disk facing set. ....	1	2.65	503580—Hood grille .....	1	7.00
413050—Idler arm bush. ....	1	.40	753410—Pressure plate .....	1	3.50	504434—Hood top panel, L. .	1	9.00
263278—Cross shaft .....	1	6.50	753615—Cover & spring .....	1	6.75	503915—Hood side panel, L. .	1	3.00
263305—Cross shaft bush. .	1	.30	1314655—Spline shaft .....	1	9.00	4102033—Instrument panel, L. .	1	8.00
263417—Gear housing .....	1	3.50	99004—Pilot bearing .....	1	1.15	4104001—Cowl & dash panel. .	1	65.00
264960—Tube and worm .....	1	5.50	47507—Spline shaft brg., R. .	1	5.15	4104025—Cowl side panel, L. .	1	4.00
263303—Worm eccen. sleeve .	1	.65	TRANSMISSION			4081958—Cowl vent, seal. ....	1	.50
11BC—Worm brg. cone .....	2	.85	1312397—Case .....	1	11.50	4097023—Windshield glass ...	2	8.95
14CE—Worm brg. cup .....	2	1.05	1307848—Countershaft .....	1	1.00	4099228—Windshield seal ...	1	3.50
265870—Jacket tube .....	1	2.65	1394874—CS. bearing set. ....	1	.50	4104254—Door, stripped, L.F. .	1	27.50
264887—Jacket tube brg. ....	1	.75	1310985—CS. gear cluster. .	1	11.00	4104178—Door pillar, L. cen. .	1	7.50
504213—Steering wheel .....	1	7.00	1308377—Mainshaft .....	1	6.00	4093569—Door lock striker. .	4	.40
COOLING			7S053—Mnshft. pilot brg. ....	14	.02	4073913—Dovetail wedge plate	4	.30
3113437—Rad. core assem. ....	1	45.00	7506—Mnshft. brg., R. ....	1	4.10	4099832—Dovetail shoe .....	8	.10
503870—Rad. shell support ...	1	9.50	1307764—Low sliding gear. .	1	5.00	4091960—Door weatherstrip. .	4	1.00
503675—Rad. grille, L. ....	1	10.00	1314642—Second speed gear. .	1	6.00	4097027—Door glass, front. .	2	5.50
503674—Rad. grille, R. ....	1	10.00	1307805—Second speed sleeve .	1	4.00	4097024—Door vent, glass. .	2	3.25
504734—Rad. grille panel, C. .	1	3.75	1307851—Reverse idler gear. .	1	4.80	4099919—Glass regltr., L.F. .	1	2.50
1510916—Thermo gage (dash) .	1	4.50	1314659—Synch. drum .....	2	2.50	4099392—Vent. regltr., L. ....	1	1.55
3108570—Thermostat .....	1	1.00	1313679—Cover .....	1	.50	4090545—Vent. wthstrip, L. .	1	1.15
504997—Shaft, brg. & seal. .	1	3.00	502489—Gear shift lever. ....	1	1.50	4091100—Remote cntrl., L.F. .	1	.55
501182—Water pump assem. ....	1	7.50	502500—Shift control shaft. .	1	2.00	4099765—Door lock, L.F. ....	1	1.75
895159—Shaft bearing .....	1	3.00	504135—Selector rod .....	1	.35	4091127—Door handle, inside .	4	.65
504998—Pump seal .....	1	.50	1312989—Selector shaft .....	1	.75	4045914—Door glass run, F. .	2	1.25
F01398—Fan blades .....	1	1.50	503874—Selector shaft lever. .	1	.75	4099879—Door sill, L. F. ....	1	2.25
500064—Fan belt .....	1	1.35	502498—Control rod .....	1	.40	4104112—Quarter panel, L. R. .	1	26.00
FUEL AND EXHAUST SYSTEMS			1308073—Shift lever, low. ....	1	.40	4091380—Back window glass .	1	8.75
463S—Carburetor assem. ....	1	19.00	1307864—Shift fork, low. ....	1	.85	4099021—Back glass seal. ....	1	2.50
1515371—Gas gage (dash) .....	1	1.80	1312407—Shift bar, low. ....	1	.60	4091937—Roof panel, metal. .	1	44.00
1515481—Gas gage (tank) .....	1	1.90	UNIVERSALS			4103619—Trunk lid .....	1	15.00
496—Fuel pump .....	1	2.50	504633—Front yoke assembly .	1	4.25	4091472—Trunk lid seal .....	1	2.25
515—Fuel & vac. pump .....	1	*4.80	406803—Cross .....	2	1.25	4091786—Rocker panel, L. ....	1	2.25
503651—Inlet manifold .....	1	6.75	406828—Bearing, round .....	4	.85	4091830—Rear end panel. ....	1	3.25
503591—Exhaust manifold .....	1	8.75	406829—Bearing, trunnion. .	4	.90	503559—Frame .....	1	60.00
500867—Muffler .....	1	3.75	406813—Cork packing .....	8	.05	503681—Front crossmember. .	1	12.00
502774—Tail pipe .....	1	1.75	501777—Pinion shaft flange. .	1	2.25	503568—Running board, L. ....	1	9.50
504117—Exhaust pipe .....	1	1.70	504631—Propeller shaft .....	1	9.25	503556—Run. brd. apron, L. .	1	1.50
ENGINE GASKETS			REAR AXLE			503583—Apron molding, L. .	1	1.00
504279—Carb. to mani. ....	1	.07	502187—Housing .....	1	15.00	503709—Run. brd. mold., L. .	1	1.10
408151—Fuel pump .....	1	.03	231969—Cover .....	1	1.30	501928—Run. brd. brkt., L.F.	1	.25
496783—Exh. pipe flange .....	1	.10	231961—Cover gasket .....	1	.10	504158—F. bumper bar, L. ....	1	3.00
503434—Mani. to block, set. .	1	.30	502174—Diff. carrier assem. .	1	60.00	504154—F. bumper bar, C. ....	2	1.75
503604—Inl. to exh. mani. ....	1	.10	501825—Diff. carrier & caps. .	1	12.00	504152—F. bumper bracket. .	2	1.65
499414—Cylinder head .....	1	1.10	501958—Diff. carrier gasket. .	1	.05	504068—R. bumper face bar .	1	8.00
544352—Oil pan set .....	1	.40	501828—Differential case ...	1	6.00	502034—R. bumper bracket. .	2	1.65
494663—Main brg. seal .....	2	.02	501833—Differential pin .....	1	.75	1947D—Shock absbr., L. F. .	1	*7.15
499644—Timing case .....	1	.05	499503—Differential pinion. .	2	1.25	1116V—Shock absbr., Rear. .	2	*3.45
499643—Timing cover set .....	1	.15	499504—Diff. side gear .....	2	3.50	BRAKES		
492085—Timing case seal .....	1	.40	504797—Pinion & ring gear. .	1	15.00	502706—Rear brake cable. ....	1	3.40
494872—Valve cover .....	2	.15	501839—Pinion oil seal. ....	1	.50	504442—Hand brake cable. ....	1	2.25
494904—Water outlet .....	1	.02	5306—Pinion bearing, F. ....	1	7.80	504544—Hand brake pawl. ....	1	.20
503539—Water pump to cyl. .	1	.03	C1509—Pinion bearing, R. ....	1	3.40	504541—Hand brake sector. .	1	.75
ENGINE PARTS			A1652752—Diff. bearing .....	2	4.35	501613—Master cyl. assem. .	1	*3.25
503986—Block with pistons, .	1	135.00	412111—Grease retainer .....	2	.50	5450070—Master cyl. cup. ....	1	.20
503572—Cylinder head .....	1	15.00	502064—Axle shaft, L. ....	1	7.00	231432—Secondary cup .....	1	.20
501748—Cylinder head (spl.) .	1	15.00	88128—Axle shaft bearing. .	2	7.00	5300850—Master cyl. boot. ....	1	.35
503645—Oil pan .....	1	4.00	REAR SPRINGS			5450213—Check valve .....	1	.25
503554—Crankshaft .....	1	49.50	504357—Assembly .....	2	12.00	5450150—Check valve seat. .	1	.15
499603—Camshaft .....	1	11.00	502342—Front bolt .....	2	.20	503234—Wheel cyl., L. F. ....	1	*1.60
499756—Vibration damper .....	1	7.50	499533—Shackle bushing .....	4	.20	231333—Wheel cyl. cup, F. ....	4	.20
502448—Flywheel .....	1	8.25	495035—Shackle link, inner. .	2	.30	1409133—Wheel cyl. cup, R. .	4	.20
502153—Flywheel gear .....	1	2.00	500305—Shackle link, out., L.	1	.50	5450031—Wheel cyl. boot. ....	8	.15
503050—Piston & pin .....	8	3.50	499538—Shackle pin .....	4	.20	503925—Brake hose, F. ....	2	1.25



# BIGGEST SELLING STORY

## A DEALER EVER HAD TO TELL

### *The New OLDS Story!*

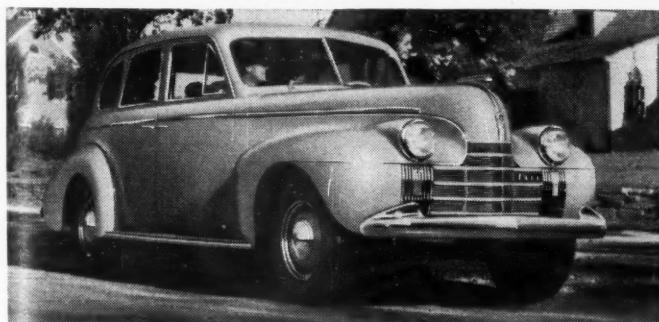
**BIGGER AND BETTER CARS! BIGGER AND BETTER APPEARANCE!... BIGGER AND BETTER BODIES! BIGGER AND BETTER "RHYTHMIC-RIDE" CHASSIS! BIGGER AND BETTER SAVINGS IN GAS, OIL AND UPKEEP!**

HERE'S a bigger and better proposition for the up-and-coming automobile dealer. A whale of a selling story for every type of prospect, because Oldsmobile is offering bigger and better "packages" right up and down the line. But an Oldsmobile deal doesn't stop with the product! The Oldsmobile franchise is known throughout the industry as one of the fairest and squarest in the business. Go big with Olds in 1940. Make money with America's biggest money's worth!



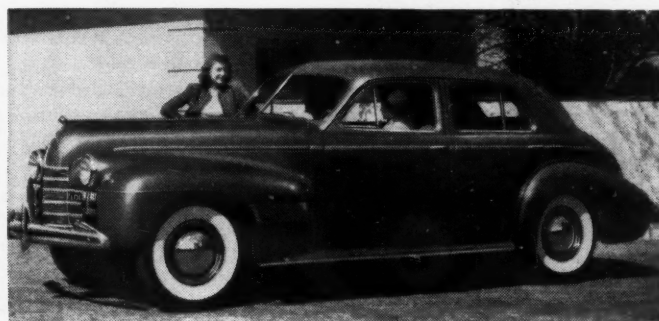
**NEW OLDS  
"SIXTY"**

The great big car in the low price field. 16½ feet in overall length. 95 H. P. Econo-Master engine that saves more on fuel.



**NEW OLDS  
"SEVENTY"**

The fast-selling, popular-priced Seventy is now bigger and finer than ever, with new Styleleader Styling, new comfort and luxury in its Observation Bodies by Fisher, and an even smoother Rhythmic Ride.



**NEW OLDS  
"CUSTOM 8 CRUISER"**

A sensation in luxury, inside and out. 124-inch wheelbase. 210 inches from bumper to bumper, 110 H. P. engine. Finest eight ever offered at medium price.

# GO BIG WITH OLDS! IN 1940

**BIGGER AND BETTER IN EVERYTHING!**

MORE STYLE • MORE SIZE • MORE ROOM • MORE LUXURY • MORE COMFORT • MORE SAFETY • MORE POWER • MORE PERFORMANCE • MORE ECONOMY • MORE VALUE

MAKE MONEY WITH



AMERICA'S BIGGEST MONEY'S WORTH

## Lady Does Picking

(Continued from page 17)

Our conversation was interrupted at this point by a dark head thrust in the door, and a "Say, Jack, can I borrow your spark plug tester?"

"Come in a minute, Fred," Jack invited. "Here's a lady wants to know about women that come in for service—how we like 'em and how we treat 'em."

"Humph," snorted Fred, "Women are too fussy," and by "fussy" I found he meant that we women want to know what we are paying for and why

the repair was needed. "Fussy" seems to mean that we aren't ashamed to ask the price, and that we insist on clean cars. I guess he's right.

Why do we demand these attentions? Look, . . . Has a sweet and lovable brat ever stuck gooey fingers on your clean white collar when you were already to step out? There's no difference in that and our finding that our once white gloves are now gray because the steering wheel as well as the transmission got greased. Like I told Jack, if we ruin a dress or shoes on a dirty old car, few men, and fewer budgets will allow us new ones. My pocketbook can't stand a bill for new connecting rod bearings when some

man collects a fee every month for keeping my car lubricated and filled with oil.

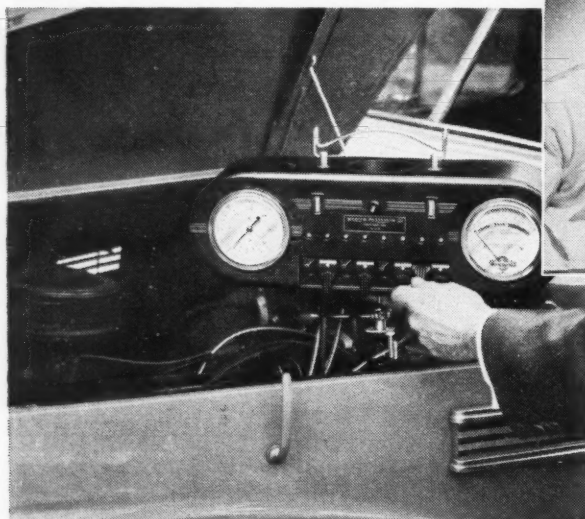
"Isn't there anything you all like about garages?" asked Jack.

"Certainly," I told him, "you do lots of nice things every time we come in, but we rarely learn about them at the proper time. Whenever I've taken a car in for service, some little thing (and lots of them weren't so little) has been done for me without charge, but I never learn about these unless I go back with a complaint, then they tell me—all injured innocence—'well, we did take the rattle out of the door for you, and didn't charge for that.' Why not do a little horn-blowing before its forced out of you? With a little reserve on the plus side of the ledger we won't be so anxious to kick, and we'll be more willing to give you the benefit of the doubt. After all, maybe that squeak is a new one; maybe you did check the battery when you said you did, and it's just had an extra load lately.

"There are a lot of good things about garages—in fact most things are good when you get right down to it; but like every place else in the world, the good is hard to find when the bad makes so much noise."

## MORE COMPLETE...COSTS LESS...WORKS FASTER PAYS PROFITS QUICKER

### WARNER PORTABLE Motor Analyzer



Here's how the

### WARNER Portable MOTOR ANALYZER

will pay PROFITS quicker



You have NEW profits—profits that never before were possible—in motor tune-up! For the New Warner Portable Motor Analyzer has opened up a new way to make your tune-up business more practical . . . and more profitable . . . than ever before.

You'll find the Warner Portable Motor Analyzer bringing you . . . for the first time . . . business on tune-up without a single guess, eliminating "free service."

Write NOW, giving the name and address of your equipment supplier, for complete information on why the Warner Portable Motor Analyzer is the profitable tune-up equipment for YOU. Discover why alert automotive merchandisers everywhere are saying:

**"A Better, More Accurate, Complete, and Portable Analyzer for well UNDER \$100! That is NEWS!!"**

## WARNER PORTABLE MOTOR ANALYZER

**1. Complete:** Handles all motor analyzing jobs—including motor testing never before possible outside the laboratory!

**2. Portable:** No bigger than a small radio! Carry it to any part of the drive or shop—or on road service calls.

**3. Sensibly Priced:** SELLS FOR WELL UNDER \$100!!!

**4. Accurate:** Analyzes motor—and electrical system—while the motor is running! Without disturbing or removing parts! Locates the exact point of motor trouble.

**5. Simplified:** Easy to use! Any service man or apprentice can learn to use the Warner Portable quickly!

**6. Profitable:** Corrects as well as checks! Every time the service man uses the Warner Portable he makes possible the sale of parts and service which 1) Restore and balance compression; 2) Bring carburetor and ignition up to standard performance.

### WARNER PATTERSON COMPANY

Makers of Warner Liquid Solder  
Warner Radiator Cleaner  
Warner Cooling System Protector

920 South Michigan Avenue  
Chicago, Illinois, U. S. A.

## Weatherhead Has

### New Hose Kit

The Weatherhead Co., 300 E. 131st Street, Cleveland, Ohio, announces a new flexible hose utility kit, H-222, for garages and service stations. Containing 100 in. of hose and a selection of more than 40 fittings, the kit enables anyone in a few minutes to make up emergency fuel lines, oil connections and oil filter lines. The fittings are conveniently carried in metal compartments in the center of the box while the hose is coiled around it.

## NEWSTOON

William Shapiro, 28, of Minneapolis, Minn., was quite peeved about motorists who break laws when he went to the city attorney's office to file a complaint against a hit-run driver.

Traffic Sergeant Wetherille, who heard the complaint, thought Sha-



piro's name was familiar, so he investigated. He found five warrants naming Shapiro for traffic offenses.

Shapiro, as he sat in jail awaiting trial, was still peeved.



# Thermoid

## TOOK THE "GUESS" OUT OF BRAKE LINING

*Now* **Thermoid**  
MAKES  
**PRECISION  
PROCESSED  
BRAKE SHOES**  
AVAILABLE EVERYWHERE



### THERMOID BRAKE SHOE EXCHANGE SERVICE

Thermoid Precision Processed Brake Shoe Exchange Service has brought better service work and higher profits on brake reline jobs to shops in all important metropolitan areas.

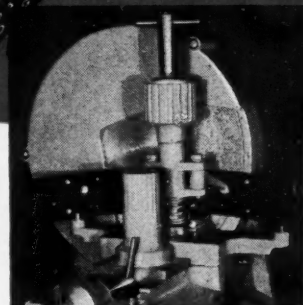
The mechanic simply removes the old shoes and exchanges them at the jobber's for completely renewed shoes. These renewed shoes have been checked, chemically cleaned, painted, and relined with Thermoid Custom-Built Brake Lining, certified correct for the particular car by Pittsburgh Testing Laboratory. Finally they have been Precision Burnished to give 100% lining-to-drum contact from the very first application of the brakes.

### DEALER'S "PAY-AS-YOU-PROFIT" EQUIPMENT PLAN

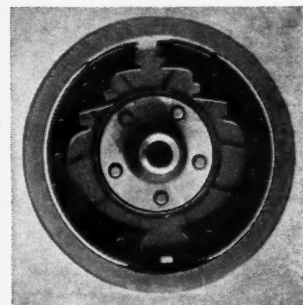
In smaller trading areas where Brake Shoe Exchange Service is not available, Thermoid offers a separate Precision Processing plan.

Thermoid will supply the engineering information and equipment for Precision Processing, on a rental-purchase plan that gives you ownership within eighteen months. The monthly cost is so low that you can't afford to pass up the extra profits and business that Precision Processing will bring you.

If Brake Shoe Exchange Service is not available in your area . . . be sure to ask your jobber for the details of this "Pay-as-you-profit" Plan.



An important step in Thermoid Precision Processing. Correctly installed Thermoid Brake Lining is burnished to the exact drum diameter, with the shoe mounted on the same points on which it is located on the backing plate.



Here's the result—immediate, perfect 100% lining-to-drum contact. It takes less time to adjust correctly burnished brake shoes, and they give positive, equalized brakes right from the very first brake application.

**Thermoid** *Custom-Built*  
**BRAKE LINING SETS**

THERMOID CO., TRENTON, N. J.



December estimate of passenger car and truck production, made by Al Laansma our Detroit Merchandising Editor, was 450,000 units which indicates the industry continued to step along ahead of 1938, this month

by about 43,000 cars and trucks.

From the same city comes word from Joseph Geschelin, Detroit Technical Editor, that an independent manufacturer is working on the de-

velopment of a unique clutch which, they claim, is simpler and less expensive than conventional clutches. For one thing, the entire clutch mechanism, including the plate, is housed within the flywheel. It has less parts than a conventional unit due to the use of hairpin springs in combination with a special system of levers. Chief talking point from a service standpoint is generous provision for air cooling—drawing air through louvers in the flange of the flywheel, exhausting through slots in the rim on each side of the disc.

\* \* \*

The entire industry seems pleased with business in 1939 and most manufacturers appear to expect this new year to be even better. Willys reports sales of its 1940 models have been more than double that of the '39 models in the same period to date. J. J. Newman, vice-president of B. F. Goodrich Co., estimated a car battery year of \$110,000,000 for 1939—approximately 15 per cent better than 1938. Sieberling Rubber Co. announces profits for its 1939 business were three times as high as in 1938, with sales soaring to a new 10-year high.

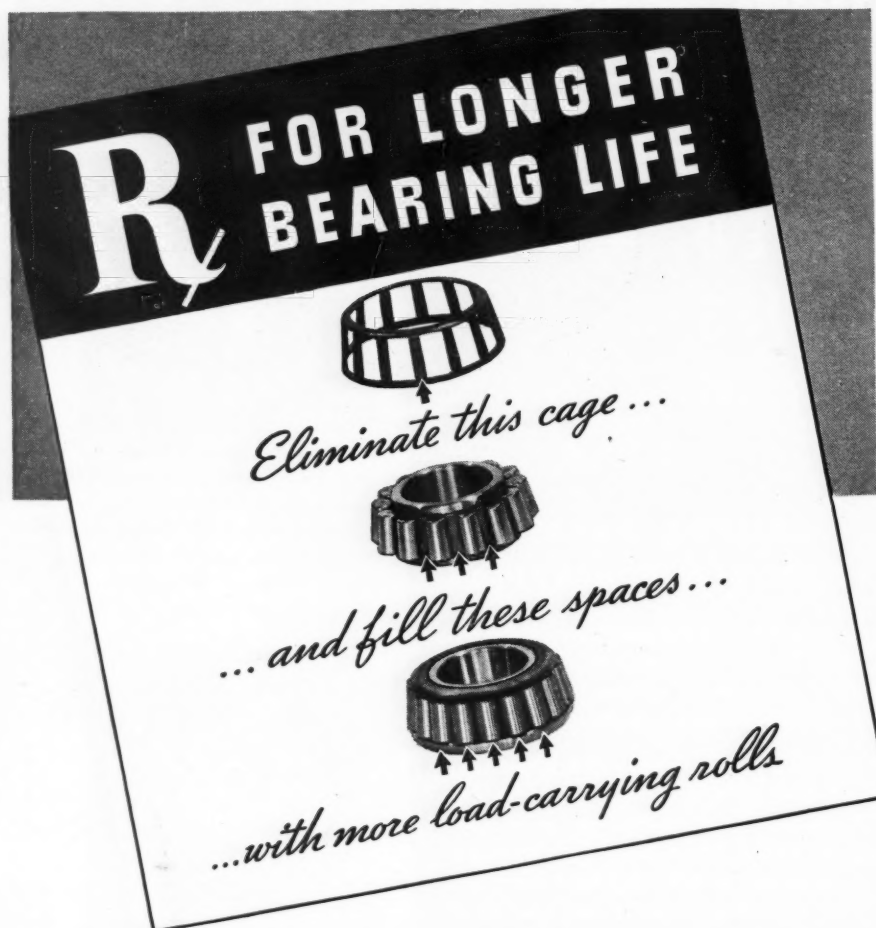
Those reports from three branches (Continued on page 42)

## Mile-a-Minute

(Continued from page 19)

(.625 cu. in.) the main reason being is to keep the weight and size down to the model class. A large model could easily become a very dangerous plaything unless these precautions were taken.

The event takes place within a 220-ft. circle. A ball-bearing swivel post is put up in the center of the area, and the cars are run off the usual 35-ft. tether cord. Time is taken on six successive laps and speed computed on that basis. Many of these cars cover this quarter-mile distance at about sixty miles to the hour. There are front drives, as well as rear drives, direct gear drives and friction clutches, and many cars have their engines mounted right onto the front axle. At the completion of the test run, one of the timekeepers reaches out with a long stick and knocks down an eight-inch extension switch that is attached to the engine, thus stopping the engine and halting the car. Castor fumes are evidence of a general popularity of this lubricant, but many owners do not divulge the nature of their fuel blends. 10 c. c. engine dimensions are limited, but the size of the cars vary greatly. There are many ingenious ways and devices of starting these cars. There is the conventional rear assembly of a cicule, and the old fashioned thong, and many contestants use a six volt battery and motor rigged up in a box on top of which are opposed disks that contact the flywheel of the midget to start the engine. Others have a hand-actuated roller that combines the features of a starter with those of a dynamometer and a means of reading a tachometer, and the rig is air cooled through the radiator of the midget car. Contestants from all parts of the country take part and the events usually draw large crowds.



● This is the Tyson formula for a better tapered roller bearing. Tyson does away with the space-consuming cage; adds more rolls. Result—greater capacity... double the life... maximum rigidity. Ask your Tyson jobber.

Cageless FOR HARD SERVICE Cage-type FOR REGULAR SERVICE

# Tyson

TYSON ROLLER BEARING CORPORATION, MASSILLON, OHIO





**RELIABLE?**  
NO OTHER GASKET  
CAN TOUCH IT  
FOR SERVICE

**FITZGERALD** service—long wear, heat-proof, positive sealing—is a strong point with me. The way our Fitzgerald installations stand up in the long haul, high-compression jobs that really bring the money into this shop, is the way to keep good customers satisfied. And we've found that satisfied customers come back themselves and tell their friends about us. The Fitzgerald Bulldog Gasket takes care of our toughest jobs. It just won't burn. The complete Fitzgerald line fills the bill for everything else in the gasket and grease retainer line; any make, any model, any year—'way back to 1906. Send for free copy new Gasket-Getter Chart No. 111, listing sets exclusively.

The Fitzgerald Manufacturing Company,  
Torrington, Connecticut. Branches, Chicago and  
Los Angeles — Canadian **FITZGERALD** Limited,  
Toronto.



**The FITZGERALD Line**

- Copper Asbestos Gaskets
- Metal Koro Asbestos Gaskets
- FITZ-Rite Gaskets
- Cork Gaskets
- Gaskets of many other types, materials, and construction
- Grease Retainers

# FITZGERALD

# GASKETS

THE COMPLETE LINE THAT COMPLETELY SATISFIES

**SINCE  
1906**

# KOETHERIZING

## ***Helps you crack the volume market on overhaul jobs***

The Van Dervere's may drive the classiest cars, but you could stick their "overhaul" business in your vest pocket. The Van Dervere's trade 'em. But not the Joneses. They pick up...mostly where the Van Dervere's leave off. In fact, 70% of all cars on the road were bought by their present owners at prices averaging less than \$250. They've got to have them repaired and overhauled to keep them on the road.

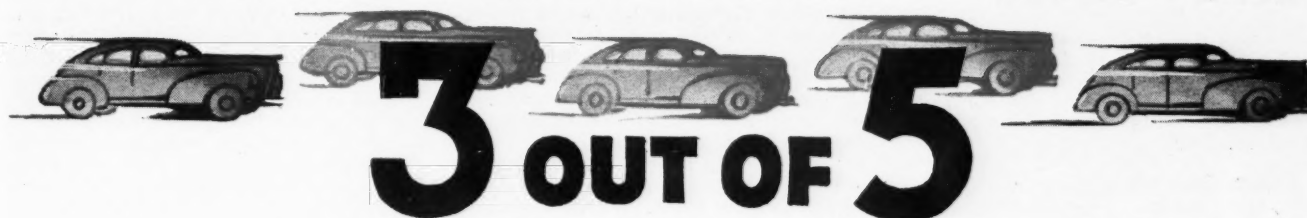
No wonder the "Joneses" pay the lion's share of America's annual bill of three billion dollars for labor and parts on repair jobs.

The shops that really cash in on this tremendous business are the ones who have found out how to offer first class repair and overhaul jobs... at prices that fit the pocket-book of the average car owner.

It's not by accident that the repair business leaders in every territory are the ones who sell Koetherizing with every piston they pull. Koetherizing makes any ring job a better job. It eliminates the need for piston replacement. It permanently restores piston skirts to original factory clearances. Yet Koetherizing costs no more than ordinary piston skirt expanders.







# 3 OUT OF 5

**CAR OWNERS EARN \$30<sup>00</sup> PER WEEK OR LESS**

***but they're the answer to volume sales***

From every standpoint, it's obvious that the so-called lower income group is the "volume group" when it comes to automotive repairs. If you expect to get your full share of that volume, you have to offer competitive prices.

But you can't afford to cut corners on either your quality or your profits. When it comes to general overhaul work, here's the answer that doesn't call for cutting corners.

## MEET THEIR OVERHAUL NEEDS with KOETHERIZING

Koetherizing is an exclusive, patented process that permanently expands pistons to recommended factory clearances. There is no other process like it. There is no other process that gives such accurate expansion control, nor such permanency. It has proven itself an indispensable part of every thorough-going overhaul because it makes



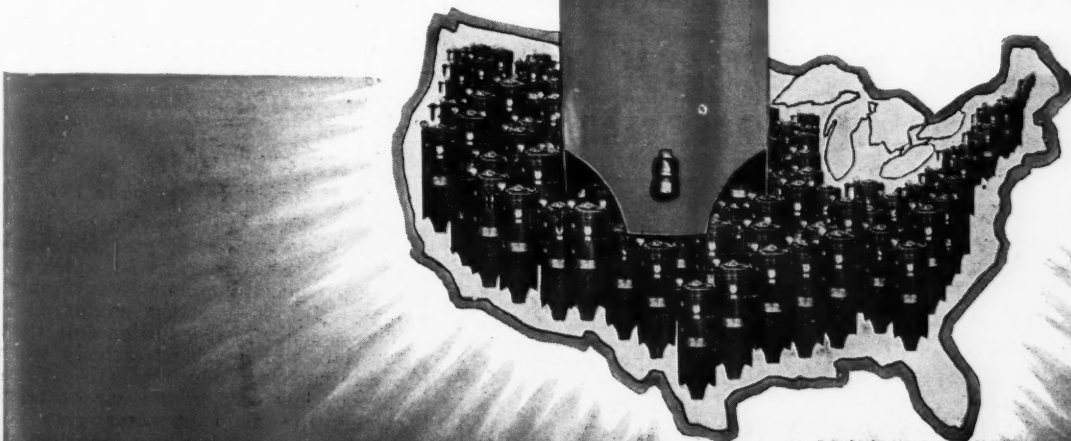
any ring job a better job . . . and assures quieter engine operation.

You can sell Koetherizing at a generous profit, and still stay within the cost of ordinary skirt expanders. The process itself takes a matter of minutes . . . far less, in fact, than the installation and adjustment of skirt expanders.

Koetherizing is available to you through the jobbers of American Hammered Piston Rings. They can give you immediate service and dependable accuracy.

No matter what kind of piston rings you recommend . . . sell Koetherizing with your next ring job. The price makes it easy. And you'll reap a dividend in customer satisfaction that will make you join the thousands of other repair shops from coast to coast who Koetherize every piston they pull.

**KOPPERS COMPANY**  
American Hammered  
Piston Ring Division  
Baltimore, Maryland



# ERIZING

A NATIONAL SERVICE  
OFFERED BY  
JOBBER OF  
AMERICAN HAMMERED  
PISTON RINGS

## Factory Smoke

(Continued from page 38)

of the industry may give you a rough idea of how things are looking up all along the line.

This is a birthday season for Packard—the fortieth. The first Packard car was completed Nov. 6, 1899. A partnership, organized to build other Packard cars, was formed Dec. 30, 1899. The first sale of a Packard car occurred Jan. 3, 1900.

J. W. and W. D. Packard, electrical fixture manufacturers, built the first Packard in their factory at Warren,

Ohio. It ran so successfully that the Packards formed a partnership with George L. Weiss, one of the organizers of the Winton Co., to build more of the machines.

In the fall of 1900 the first automobile show was held in the old Madison Square Garden in New York. Packard is the only now existing company which displayed its horseless carriages in this show. All of the three cars exhibited were sold. The sales and the certain promise of more launched the newly formed partnership into the Ohio Automobile Co., formed in 1900. The name was changed to Packard Motor Car Co. in 1902, and the plant was moved to Detroit in 1903.

Those of you who couldn't join the trek to the New York World's Fair last summer may soon have an opportunity to see the General Motors Futurama, one of the high spots, at your local movie. Columbia Pictures chose it for a short entitled "The World of 1960." Over five million people saw the Futurama at the Fair and record overflow crowds had to be turned away. If the picture reproduces it faithfully, it will be worth seeing.

The use of rubber parts in new cars is steadily increasing, according to Walter C. Keys, mechanical product engineer of U. S. Rubber Co. In addition to reducing vibration, impact shock and dynamic stress, through various types of mountings, rubber is used to provide sealing, protection against abrasion, seats, cushions, arm rests, handles, grips, insulation, pedal seals and pads, gaskets, anti-squeak strips, door and hood bumpers, etc., etc.—all together about 300 parts per car.

The lion's share of the service business which you independents enjoy is revealed in charts included in a recent issue of Pontiac Service News. According to these charts, independents get 60 per cent of the engine tune up work, with car dealers receiving only 18 per cent. Independents do 55 per cent of the electrical service work, dealers only 20 per cent. Independents receive 40 per cent of the battery service jobs, dealers 10 per cent. Brake service goes 55 per cent to the independent, 25 per cent to the car dealer. The independents, however, play second fiddle when it comes to lubrication—gasoline service stations get 38 per cent of the business, independents 35 per cent and dealers 20 per cent.

Diamond T Motor Car Co. makes truck history by announcing a new warranty on all its Super-Service trucks. The warranty is effective for four times as many months, or 20 times as many miles as the standard warranty of the truck industry, the company states. The new warranty guarantees every truck for 100,000 miles or a full year.

## Crankshafts

(Continued from page 18)

under sizes as previously listed. With the advent of portable crankshaft reconditioning tools, which will grind the crank pins without removing the shaft from the engine, there is a tendency to recondition only those journals which are excessively worn. While such procedure has the advantage of low cost to the car or truck owner, the shop operator gets the profit on one or two bearings instead of a complete set. In addition it will tend toward complications in case any bearings are burned out on the road. It is, therefore, considered advisable whenever possible, to recondition all the crank pins at the same time.

Another recommendation is being made by some bearing manufacturers which will assist in the correct bearing sizes being ordered, and that is to stamp on the cylinder block or to attach a metal tag which will indicate the sizes of the main and connecting rod journals.



## MORE JOBS A DAY WITH X-18 VALVOLINE ALL-SEASON, ALL-PURPOSE GEAR LUBE

● It just naturally follows when one lubricant takes the place of 18 that time is saved—more lube jobs go through the rack in a day. And speeded-up service means service with a capital "S" for waiting customers—how they like it—and you!

X-18 insures safe, positive lubrication the year 'round, for transmissions, overdrives, differentials and steering gears. Inventory is cut down, mistakes eliminated, and seasonal change-over stock losses cut out.

No wonder with a "natural" like this that demand is breaking all records. The coupon will bring the story from our nearest district office, and the name of your jobber.

### VALVOLINE OIL CO.

General Offices: 540 E. 5th St., Cincinnati, Ohio • Refinery in Pennsylvania

VALVOLINE OIL COMPANY—540 E. 5th Street, Cincinnati, Ohio, or Division Offices: Chrysler Bldg., New York; 1134 Sylvan Rd., S. W., Atlanta; Tribune Tower, Chicago; 3600 Union Pacific Ave., Los Angeles.

Gentlemen: Without obligation I'd like the facts on "X-18."

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_

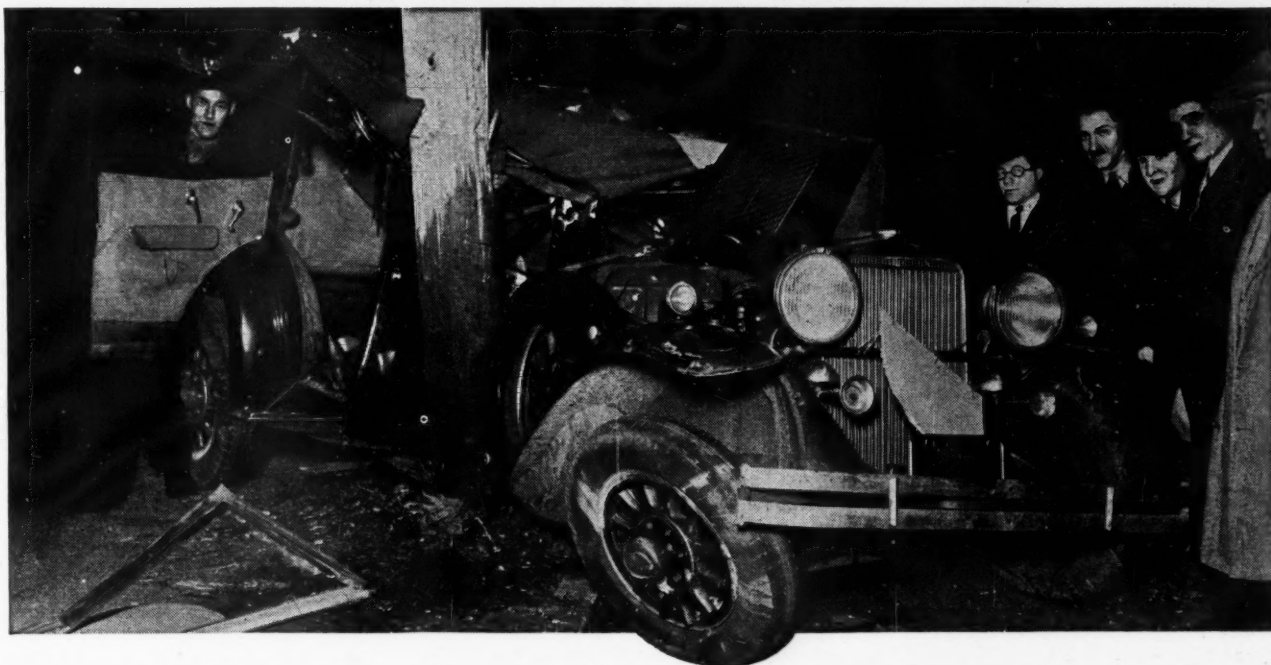
### VALVOLINE "X-18"

Meets or exceeds manufacturers' specifications such as General Motors G.M. 4664M. Replaces winter and summer grades of Gear Oils, straight and heavy duty, Passenger Car Hypoid, Truck-Duty-Hypoid, Extreme Pressure, Worm and Steering Gear Lubricants.





# *HELP STOP THIS* And Win \$1,000 Cash!



## Big J-M National Contest Pays You Money for the Best Job of Promoting Highway Safety...

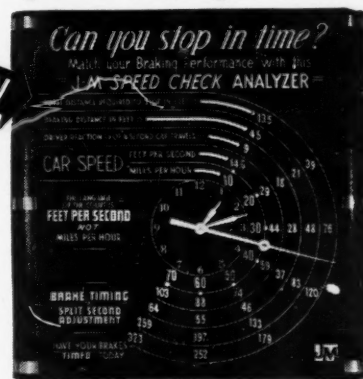
**H**ERE'S the chance of a lifetime for you to make an important contribution to safe driving in your community . . . and win a big cash prize doing it!

It's the 1940 J-M Lend-A-Hand Contest. 72 awards—\$1000 to the winner—go to those dealers who do the best job of promoting highway safety. Any owner or employee of a J-M "Brake Timing" Station is eligible . . . every one has an equal chance to win. Contest entry blanks give full details. They're ready now. Mail the coupon for yours today. If you're not already using "Brake Timing" and want to get in on the cash prizes, write us or see your jobber for details right away.

**YOU CAN WIN: \$1000 FIRST PRIZE**  
**\$500 SECOND PRIZE** **ONE OF 70 OTHERS**  
**TOTALING \$500**

### TO HELP YOU WIN A BIG CASH PRIZE **NEW**

This new J-M Speed Check Analyzer is a handsome piece of selling equipment that does for brake service what the lift does for lubrication service. It's more than just a clock . . . it gives your customers good sound reasons why their brakes need the split-second adjustment that only "Brake Timing" can give. It's a new addition to "Brake Timing" that's sure to make this outstandingly successful J-M program even more of a money maker in 1940. Find out how you can get the Speed Check Analyzer and a dealer stock of lining by just mailing the coupon.



**J-M LENDS A HAND  
FOR 1940—  
Mail Coupon  
for Details**



## JOHNS-MANVILLE

*The OLDEST Name in Brake Lining*

JOHNS-MANVILLE, Dept. MA-1, 22 E. 40th St., New York, N.Y.  
Send me full details on how J-M Lends a Hand for 1940.

Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_

## Breaker Points

(Continued from page 13)

or several degrees of cam travel for this flame to go out and if the point opening already has been reduced by wear or otherwise, there is danger that the breaker points actually may become welded. With proper point opening, or correct cam angle, the coil and condenser action is normal.

But there is another thing to be said about proper point opening. If the cam angle is too long, that is, the points are closed for too long a period, ignition is delayed. That accounts for the fact that a new car

needs a little tuning after a few thousand miles. The rubbing block has worn and ignition is delayed just enough to take a little tuning after a few thousand miles. The rubbing block has worn and ignition is delayed just enough to take a little of the original "zip" out of the engine. Why this is so will be understood from Fig. 2. With the correct cam angle, A, (assuming that the ignition timing is correct) the spark will take place at the right moment when the piston is just ahead of top dead center. If the cam angle is too great, B, the points open too late and the piston already has gone down on the power stroke. The engine is not as lively, of course.

Should the point opening be too great, or the cam angle too small, C, Fig. 2, the spark takes place too early and besides there is not enough time for the coil to become energized. The coil builds up during the time the points are closed and so, again, the proper cam angle is very important.

The way in which the breaker points come together has much to do with smooth engine performance and general behavior of the ignition system. Refer to Fig. 3, assume that the point surface is substantially flat and that this surface is at a slight angle to the axis of the points, as shown at the left in Fig. 3. The points may open a distance, A, which might be 0.020 in., or a cam angle of 34 deg. Now, suppose the breaker arm is bent or worn at its bearing so it is raised slightly in operation, as shown in the center illustration, Fig. 3. Note that the opening has been reduced to 0.014 in. and the cam angle increased to 45 deg. Again, if the arm should drop, as shown in the right-hand illustration, the point opening may go to 0.030 in. and the cam angle reduced to 25 deg.

Unfortunately breaker points usually build up a hump on one point and crater on the other. This aggravates the conditions in Fig. 3.

A word about setting breaker points. If the shop has one of the several types of distributor test fixtures in which the complete unit is mounted and operated for conditions of wear, governor action, vacuum retard, cam angle, etc., much time is saved and the unit can be reconditioned for standard operating requirements very quickly.

In the absence of such a test unit, the mechanic must use feelers for the breaker point opening. Flat feelers are not desirable for this because of the possible chance for error. We have seen that proper point opening plays a big part in obtaining correct cam angle. Assuming that the distributor shaft is not worn, that the cam is in good order, new breaker points, proper spring tension on the points, etc., it is reasonable to believe that the cam angle will be sufficiently correct if the mechanic carefully adjusts the point opening with a feeler gage.

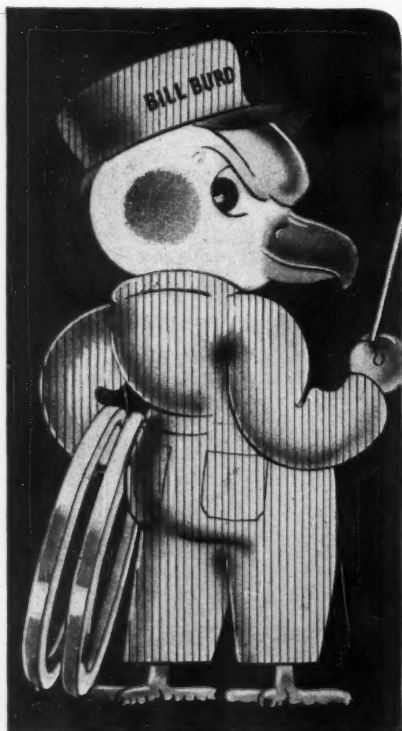
Note in Fig. 4, that a flat feeler can give the wrong indication as to point opening. The actual opening may be considerably greater than that indicated by the feeler. This is because of the hump or buildup on one of the points. It is better to use feelers made of round stock, as shown in Fig. 5. Such feelers are convenient to use and a dental mirror used along with them to ascertain the condition of the points is a handy item.

Always make sure that the breaker arm is free on its hinge pin and that the contact points line up properly. Always bend the stationary contact—never the breaker arm between the rubbing block and point. The rubbing block can be lined up squarely with the cam by inserting a piece of white paper and carbon paper between the rubbing block and cam. By turning the cam an impression is made on the white paper showing which way the arm must be bent between the hinge pin and rubbing block. It is not necessary to get an impression

(Continued on page 60)

## START 1940 RIGHT WITH "Graf-Flox"

....BURD'S AMAZING NEW PROCESS THAT  
REVOLUTIONIZES PISTON RING PERFORMANCE



**1** Instant self-seating. "Graf-Flox" processed rings eliminate the customary run-in period.

**2** Self-lubricating. "Graf-Floxing" definitely prevents possibility of scoring or seizing.

**3** Free flexibility. Inherent lubricating qualities of "Graf-Flox" guard against rings sticking in piston grooves.

**4** Surer oil control and power sealing. More flexibility and less wear assure lower oil consumption—higher power production.

"Graf-Flox" treatment, now available in Burd "Quik-Seal," "Hi-Speed" and "Super Hi-Speed" types, is Burd's greatest development in 25 years of piston ring manufacture. Start 1940 right. Build a sound, profitable business on "Graf-Flox" rings. Enjoy the extra profits their brilliant performance brings. Write today for profitable proposition.

GET PROMPT SERVICE FROM ANY  
OF THESE BURD WAREHOUSES

ATLANTA, GA.  
542 Spring St., NW  
CHICAGO, ILL.  
2236 S. Wabash  
DALLAS, TEXAS  
2705 Canton St.  
KANSAS CITY,  
MO., 1606 McGee  
LOS ANGELES,  
1500 So. Hope  
MINNEAPOLIS,  
21 S. 13th St.  
NEW YORK, N. Y.  
549 W. 52nd St.

ST. LOUIS, MO.  
3225 Locust Blvd.  
SAN FRANCISCO  
540 McAllister St.  
SEATTLE, WASH.  
1525—10th Ave.

Canada:


MONTREAL,  
732 S. Antoine  
TORONTO, S.  
20 Hayter St.  
WINNIPEG,  
26 Lombard St.

BURD PISTON RING CO.  
Rockford, Illinois  
(Associate Co., Liberty Foundries Co.)



**BURD**  
"Graf-Flox"  
PISTON RINGS





# U.S. LIFTS

## LEAD IN *Economy*

Economy in this case begins from the moment you purchase a U. S. "Tailor Made" full hydraulic drive-on lift. It means they are cheaper to own, cheaper to operate, cheaper to maintain, cost no more than ordinary lifts, yet they have more exclusive features than any lift made. They earn their keep and pay for themselves many times over.

SEND FOR FREE CATALOG AND GET FURTHER PROOF OF U.S. SUPERIORITY

Many of the major oil companies' engineers have put them thru the acid test and in practically every instance they have sold themselves to the majors. U. S. Lifts lead the field in economy, performance, speed, and durability. Do what the big fellows do . . . buy a U. S. Lift . . . save money, trouble, handle more jobs and make bigger profits.

# THE U. S. AIR COMPRESSOR COMPANY

Air Compressors

Cleveland, Ohio, U.S.A.

Hydraulic Lifts

Greasing Equipment

# LEGALLY SPEAKING

by C. R. ROSENBERG, JR.

**A lawyer's interpretation of Federal and local court decisions of interest to repairmen, presented each month**

## Records of Stolen Goods

**A**DEQUATE records of merchandise and other items stolen from his shop or garage may be essential to the protection afforded a repairman under a burglary insurance policy.

Many burglary insurance policies provide that books and records must be regularly kept in such manner that the exact amount of loss can be accurately determined therefrom by the insurance company. Under such a policy the insurance company is not

liable for a loss unless such books and records have been kept.

Discussing such a requirement in a burglary policy in a case before it, a Federal court recently said:

"If the books and accounts of one engaged in a commercial enterprise are to be deemed to have been regularly kept, they must be kept in such wise that the insurance company may be able to ascertain the essential facts of the loss from them. The insurance company may not be compelled to pay losses unless such records have been kept by the assured as will permit the insurance company to investigate the losses in the usual way and be able to ascertain that the loss was actually incurred by the insured. Books and records are not regularly kept when they afford no data from which the insurance company may ascertain from some source independent of the insured that the insured did in fact purchase the articles alleged to have been stolen."

## Good Will Protected

**T**HE law's protection of the business man against unfair competition covers not only his business name and trade marks, but extends to that intangible but valuable thing called good will. In a recent case where a competitor was selling a product similar to that marketed by another business house for many years, but under a different name, the Federal court declared that the competitor "apparently desired to cash in and receive the benefit of the good will which the other concern and its predecessors had built up during more than seventy years of business activity."

"Money invested in advertising," continued the court, "is as much a part of a business as if invested in buildings or machinery, and when goods have become popular not only because of their intrinsic worth, but also by reason of the ingenious, attractive and persistent manner in which they have been advertised, the good will thus created is entitled to protection against unfair competition."

## Landlord Claims Equipment

**T**HERE'S a pointed reminder in a recent Federal court decision that a repairman may unknowingly make a "gift" of equipment to his landlord when he installs it in a rented building. If the equipment should be considered by the law as a permanently attached fixture, it becomes part of the real estate to which it is attached and hence the property of the landlord.

In the case in question the tenant apparently tried to protect himself in this respect by a provision in the lease that all additions, alterations and improvements put in at the expense of the tenant would become part of the real estate, but this was not to include "movable furniture" installed

(Continued on page 60)



## SERVICE 118 CAR MODELS!

**A** BRAND new, fast-stepping money-maker! Just the kind of smart, wide-awake merchandising that builds brisk winter business for the live serviceman! Believe it or not, these 3 GUARANTEED Lock-Type Coils — specially engineered — fit 118 car models: an immense market! Think of the sure-fire turnover—on such a small investment. The winter coil season is now here—so

Ask about this  
3-Coil Kit now!

• These 3 Lock-Type Coils incorporate the exclusive GUARANTEED feature: "Engineered to compensate for wear!"

**GUARANTEED PARTS CO., Inc. • Seneca Falls, N.Y.**

ORIGINATORS OF THE WELL-KNOWN "FOUR STAR" LINE



*Have you heard the news about these*

# TWO GREAT OIL FILTER DEVELOPMENTS?



## 1 PUROLATOR

presents a cartridge type filter with the "You-can-SEE-the-oil-is-clean" feature!

Every Purolator Oil Filter shipped from the factory today removes dirt, dust, sludge and abrasives from motor oil . . . and, in addition, keeps it visibly clean. This important feature, formerly available only in high-priced Purolator models, is now standard throughout the entire Purolator line, including all the Purolators installed as factory equipment on 1940 cars. You can see the oil is clean. You can tell your customers exactly when their Purolator needs service to give continued protection. When the oil becomes visibly dirty on the gauge stick, then it's time to replace the filter.



List Price  
**\$2.75** for most cars that are factory-equipped with Purolator fittings.

## 2 PUROLATOR

presents a replaceable-element type filter at a new low price!

With Purolator's new Sales Maker Program, you have the ideal oil filter merchandising set-up—a program with a powerful economy appeal to owners of almost five million 1933 to '39 Plymouth, Dodge, De Soto, and Chrysler passenger and commercial cars. Replace the E-½ or EA-½ Purolator cartridge with a new NE-1517. Install exactly as a replacement cartridge, using original fittings and tubing plus one extra bracket. The low list price makes the NE-1517 only 75 cents more than an E-Type replacement cartridge.



List Price  
**\$3.50** for most cars that are factory-equipped with Purolator fittings. Replacement elements list at only \$1.00

THE DANGER OF DIRTY OIL. Dirt, dust, abrasives and sludge-forming impurities are constantly drawn into gasoline engines. If not removed, they scratch and score polished surfaces, gum up closely fitting parts, steal power and waste money. It's too dangerous to take chances with dirty oil. The safe, sure way to protect the engine is to

**KEEP IT CLEAN**  
with  
**PUROLATOR**



Cut-open Purolator cartridge showing dirt and abrasives collected in 8,000 miles of ordinary driving.

Purolator does the oil cleaning job so well that it is standard equipment in the great majority of all cars factory-equipped with oil filters. Motor Improvements, Inc., Newark, N. J.

# Another **NEW** PROFIT ITEM

## AC SPEEDOMETER CABLES

*for Chevrolet, Ford, Plymouth  
and other vehicles*

Exact Length . . . Ready for Installation

**CABLE KITS ALSO AVAILABLE FOR  
ALL OTHER VEHICLES**

Another Brand New AC Opportunity for Profit with  
Tremendous Equipment Demand Behind It

**N**OW you can sell AC factory-built cables, packaged  
and ready to fit any car or truck,—quickly—easily—  
at a low price. Put in a stock today. Take full advantage  
of AC's national equipment demand.



**NOW AVAILABLE  
From All  
AC WHOLESALERS**



**2 CABLE KITS.** For practically all vehicles.  
Each kit contains one cable (with one end fin-  
ished ready for use); assorted drive tips for  
assembly on other end of cable; and "quick  
action" staking tool for making this assembly.

Installing these cables requires only that the  
dealer cut the new cable to the same length as  
that of the old. The staking operation requires  
only a minute to complete. **ONLY \$1.00 RETAIL**



**14 Factory-Assembled CABLES.** Ford,  
Chevrolet, and Plymouth cars and trucks. Each  
package contains one cable of the exact length  
required, complete and ready for use. (Many  
of these cables will also fit other vehicles.)

Installing these factory-assembled cables is  
simply a matter of removing the old cable and  
replacing with the new one. **ONLY 85c RETAIL**

**Buy and install AC Speedometer Cables and be  
sure of CORRECT MATERIAL — WORKMANSHIP — PERFORMANCE**

**AC SPARK PLUG DIVISION • General Motors Corporation • FLINT, MICHIGAN**



# Eastern Midgets Drop A.A.A. Affiliation

## Promoters Send Withdrawal Notice to Contest Board

Promoters operating 17 midget automobile races weekly in the Eastern circuit supervised by the Contest Board of the American Automobile Association will operate their events in 1940 without the AAA direction, according to formal notification which the Contest Board said it received at national headquarters in Washington, D. C.

The promoters, all "big names" in Eastern midget racing, will maintain their own governing body and will enlist other promoters in their circuit, the letter of withdrawal advised the AAA.

Signing the notification of withdrawal, the AAA said, were: Ralph DePalma, veteran driver of racing's pioneer days who has turned to promotional enterprises in recent years; Walter C. Stebbins, Harry J. Ryan, Walter Secrist, William Heiserman and John Kochman. This group has been prominently identified with progress of midget racing in the Eastern states for several years.

Affected by the promoters' decision to withdraw from the AAA are the following cities: Philadelphia, Pa.; Paterson, N. J.; Newark, N. J. (Nuttley Velodrome); Coney Island, N. Y.; Freeport, N. Y.; Cedarhurst (the latter three on Long Island); Bronx, N. Y.; Pottstown, Pa.; Baltimore, Md.; Washington, D. C.; Springfield, Mass.; Danbury, Conn.; New Haven, Conn.; Bridgeport, Conn.

Dissatisfaction over rulings of AAA officials was admitted by the Contest Board to be the probable reason for the promoters' decision to organize their own governing board.

Ted Allen, secretary of the AAA Contest Board, at Washington headquarters, said the promoters' withdrawal notice stated:

"The promoters present at this meeting (held November 6) were of the opinion that in view of existing circumstances and conditions, they will operate independently of the AAA Contest Board and supervision and without AAA Contest Board sanctions."

The Contest Board secretary contended that it was not until November 30 that he received notification of the action of the midget promoters.

Decision of the promoters was five-fold, according to the Contest Board announcement, as follows: "First, to form and operate their own governing body; second, to appoint their own race officials; third, to establish and maintain their own benevolent fund; fourth, to form their own rules and regulations; fifth, to invite other tracks to join their circuit whenever possible and when such tracks can give evidence of security."

Plans of the Contest Board to turn the AAA racing in the affected city to other promoters, when available, were outlined in the Contest Board's reply:

"Inasmuch as the statement is the first and only notice we have received, it is obvious that there was no intention to include the Contest Board in any of your preliminary discussions or to give any consideration to the plans of the Contest Board.

"The finality with which your state-

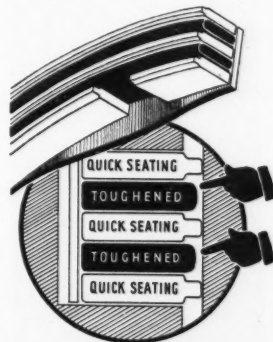
ment has been made leaves no opportunity for us to discuss the situation further with your group. We wish to advise, therefore, that the statement is accepted, as you undoubtedly intended it and as it obviously stands, i.e., as a full and complete release from any obligation whatsoever that the AAA Contest Board may have had to render territorial protection or other consideration to those gentlemen who signed the statement or to

the tracks they represent.

"Accordingly, in line with its policies of long standing, the Contest Board of the American Automobile Association now regards your respective territories as being open and we will, of course, proceed to protect our interests in the matter as circumstances warrant."

Action of the midget promoters followed closely on the heels of the Contest Board's published "statement of practices and activities in answer to unwarranted rumors and charges in circulation" against the board.

Supplementing that published statement was an address by Col. Eddie (Continued on page 58)



**W**ITH the New Year—a New Long Life Simplex Ring! Streamlined for simplicity — engineered for efficiency — sold for service — miles and miles more performance than any other ring can give you. And with Simplex "LL" Rings you get expert "on-the-piston" service too!

Do a better job in 1940 . . . .  
Give those tough oilers double 'ell with Simplex "LL".

**SIMPLEX PRODUCTS CORP.**  
3820 Kelley Avenue • Cleveland, Ohio

**SIMPLEX "LL" PISTON RINGS**

*Do a better job — give 'em "LL"!*

## Tru-Stop Increases Brake Lining Width

Tru-Stop Ventilated Disc Emergency Brakes for trucks and buses are now furnished with brake lining 2¼ in. wide instead of 2 in., as heretofore.

According to the makers of Tru-Stop Brakes—American Cable division of American Chain & Cable Co., Inc.—this change will give increased lining life and at least a 10 per cent improvement in stopping ability at high speeds. The discs have had the friction faces widened inwardly to provide for the wider linings and the

new discs are interchangeable with the discs now in service. However, the 2¼-in. linings should be used only with the discs having the wider friction face.

## Ulesky Tops

### Eastern "B" Class

Drivers who led the Eastern states auto racing championship rating for 1939 were far down the line in the final tally of the "B" class drivers just released by the American Automobile Association's Contest Board.

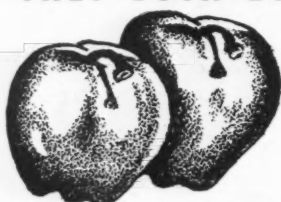
The reason Joie Chitwood, rated the best big car driver in the Eastern

states during the year, and his rivals in the major competition were unable to stay on top of the "B" standing as well as the "A" class was said to result from their busy schedule in the major events. Therefore, they did not have time to compete in the "bargain" races as often as John Ulesky, who won the "B" class rating, and others. The "B" races were allowed in sections of New York, Pennsylvania and New Jersey where racing's pulling power and other factors were not sufficient to allow the promoter to pay more than \$500 prize money. The minimum on "A" class prize purses is \$750.

Chitwood won twentieth place in the final standing of the "B" drivers. The 20 leaders are:

Position	Driver	Points
1	John Ulesky	508
2	Len Duncan	497
3	Vic Nauman	456
4	Joe Sanco	392
5	Bill Holland	346
6	E. Shaw	267
7	Henry Rogers	240
8	Newton Meyer	192
9	Walt Ader	148
10	Mike Little	90
11	Bert Ross	89
12	Harry Harper	82
13	Charles Breslin	70
14	Rex Records	62
15	Eldridge Tadlock	58
16	Jim Schumacher	57
17	Dan Goss	56
18	Mark Light	56
19	E. Terry	55
20	Joie Chitwood	54

THEY BOTH LOOK ALIKE BUT—



O'Boy! WHAT A  
DIFFERENCE  
IN THEIR TASTES.

So it is . . .

. . . with Electrical Automotive Equipment.

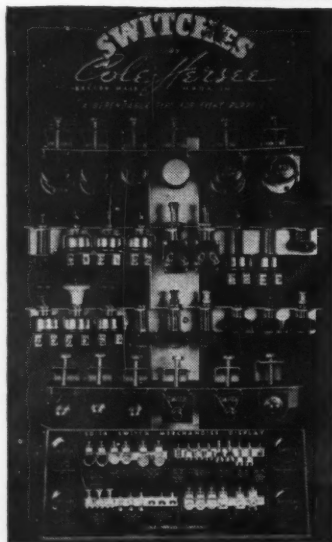
Other manufactures make many items we do . . . they look alike, but like the apples . . . O'Boy What A Difference.

Cole-Hersee Products are a recognized Standard of Quality and our pledge in the continuation of these high ideals, will always merit your confidence and loyalty.

## ANOTHER ACHIEVEMENT

by

*Cole-Hersee*



## SWITCH MERCHANDISER

No. SD-14

LIST 12.00

AND WHAT'S MORE  
it contains \$12.00  
worth of merchandise.

This new switch merchandiser is another achievement by Cole-Hersee to stimulate sales. It is real hot for the jobber and fills a long felt want for the dealer. Merchandiser contains complete assortment of 34 switches suitable for all kinds of installation. Indicating chart on bottom keeps assortment intact at all times. Switches are sold and replaced quickly with this new display.

SEND FOR CATALOG  
or any other information  
to Dept. A-1

**COLE-HERSEE COMPANY**  
54 Old Colony Avenue Boston, Massachusetts

## INDEX to

## *Cole-Hersee* PRODUCTS

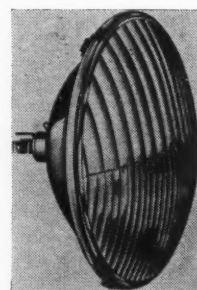
- A Assemblies Headlamp
- B Battery Charger Socket & Plug  
Beam Indicator  
Bicycle Switches and Socket
- C Clamp, Switch or Socket  
Cord Connectors
- D Dash Lamps  
Dash Switches  
Defrosters  
Defrosting Fan  
Defroster Socket and Plug  
Dimmer Switches  
Directional Switches  
Door Switches
- F Face Plates  
Fan, Auto  
Foglight Switches  
Fuse Blocks
- H Headlamp Conduits  
Headlamp Switches  
Heater Switches
- K Knobs, Switch
- L Line Connectors
- M Magnetic Starter Switches  
Momentary Switches  
Mounting Nuts
- P Pillar Switches  
Pilot Lights  
Plugs  
Push Pull Switches
- S Sockets  
With Wire Leads  
For Bicycles, Sound and  
Projector Equipment, 110  
Volt  
Socket and Plug Battery  
Charger  
Speedometer Cable  
Starter Switches  
Stop Light Switches
- T Toggle Switches  
Trailer Connectors
- W Wire Terminals

Cole-Hersee products  
are used by leading  
car manufacturers as  
original equipment.

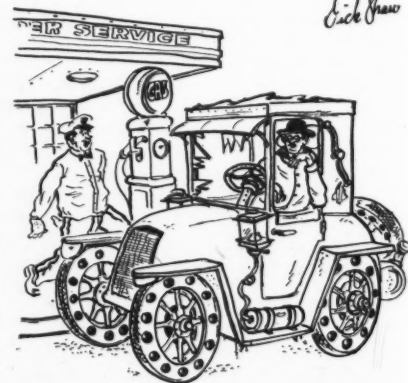
## Trippe Introduces

### New Light

The Trippe Mfg. Co., 43 E. Ohio Street, Chicago, Ill., is placing on the



market a new sealed Trippe Beam Light designed to fit the sealed-beam light slots of the 1940 cars. It has a traffic beam and a country driving beam. It uses the Trippe double reflector system and a ground and polished lens which is said to give a razor-sharp cut-off of the upper beam, a feature which reduces glare to a minimum. Properly adjusted, it is claimed that the driver can use the full power of the upper beam 90 per cent of the time.



"No air, no water, no battery or windshield—it MUST be gas!"



## Ted Nagle Forms Own Corporation

Ted Nagle, formerly director of sales, Bendix Radio Corp., Automotive Division, has announced the formation of his own company—Ted Nagle Equipment Corp. He has acquired the complete line of automotive and radio service test equipment formerly produced by Bendix Radio Corp.

The members of the engineering department who were part of Mr. Nagle's staff at Bendix will be with him in the new organization which he heads as president.

## Circo Elects Black

John F. Black was recently elected president of Circo Products Co., Cleveland, Ohio, manufacturers of equipment and supplies for automotive jobbers, service stations, car dealers and truck and fleet operators. The company announces that through a friendly transfer of stock control the management has been completely revamped. Other new officers are N. J. Leary, vice-president, and Paul E. Lees, secretary.

## Little Giant Service and Curb Jack

Recently introduced by the American Grinder & Specialty Corp., Fond du Lac, Wis., is the Little Giant model FC-1½, designed for general and curb service. The handle is made in two pieces and is easily removed from the jack to permit carrying in the service truck. Another feature is a knob in the handle which makes the handle rigid with the jack to assist in positioning the jack under the car. Jack has a capacity of 3000 lb., a low height of 3¾ in. and an extended height of 18½ in. Dealer's price \$17.45.

## U. S. Has New Sander

The United States Electrical Tool Co., 2483 W. Sixth Street, Cincinnati, Ohio, has announced a new 7-in. high-speed heavy-duty sander for general production or maintenance work. The sander is of streamline design with straight line ventilation which is said to prevent clogging and assures cool motor operation. Air outlet diverts dust-laden air from the operator. Motor is universal, operating on direct or alternating current, and is ball bearing. It comes equipped with 7-in. diameter 3-in-1 flexible rubber pad, 3 abrasive discs, spanner wrench, 3-wire rubber cable, wire for grounding and indestructible rubber attaching plug.

## Chitwood Takes 1939 Eastern States Title

Joie Chitwood, the Cherokee Indian boy, has been designated as champion of Eastern states auto racing competition for 1939 in the recheck of points made by the Contest Board of the American Automobile Association. Mark Light, the Lebanon, Pa., driver-promoter, who held the point

lead for a time in the final stages of the season and at the outset, is listed second. Light is 244 points behind Chitwood.

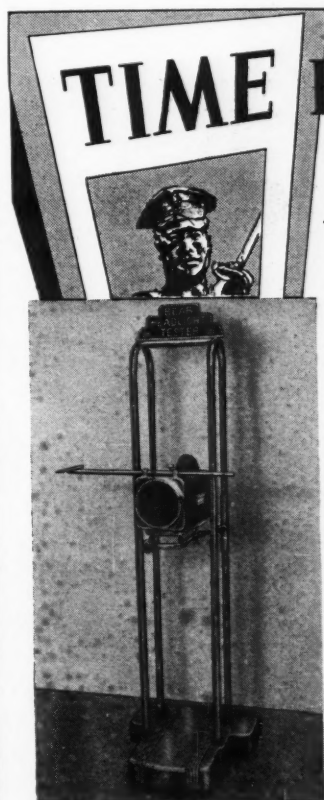
Duke Nalon, the Chicago, Ill., pilot, won the title in 1938 but slipped down to twelfth place in the final tally of 1939. Tommy Hinnershitz, runnerup in 1938, remained up in the top ranks at fourth position.

Points are awarded to the drivers according to the places in which they finish the races in the Eastern states. Points also are credited according to the length of the races.

One hundred drivers are listed on the Eastern standing. Forty-nine of them have 20 or more points.

## Comet Sanding Disc

The latest development of the Carborundum Co., Niagara Falls, N. Y., is a new type of abrasive disc for the repaint and refinish trade. This new disc, identified by its brown backing is said to be extremely fast cutting because it is coated with accurately graded tough, sharp grains of Aloxite Brand Aluminum Oxide adapted particularly to the work of removing paint, cleaning up the metal and even on the finishing of welds. Another feature of the Comet Sanding Disc is that it is being offered at a price lower than the company's regular line of Blue Backed Discs.



## BEAR HEADLIGHT TESTING BUILDS BIGGER, FASTER PROFITS!

Remember, Bear pioneered the development and was the first to offer a condensing lens type headlight tester in a compact unit that made checking and adjustment of headlights easy and simple operations.

When you install a low cost Bear Headlight Tester you equip yourself to turn out better jobs and more of them. It takes only a few minutes to check lateral aim, beam elevation and light volume of both standard and Sealed Beam Headlights.

You get more than the profits from headlight testing, too! You make extra bulb sales, get additional service work, increase fuel and parts sales to car owners pleased by the speed and accuracy of the Bear Headlight Tester. IT'S FREE AFTER THE FIRST PAYMENT BECAUSE IT PAYS FOR ITSELF AS IT WORKS! Easy to Buy at New Low Price. SEE YOUR BEAR JOBBER TODAY!

### ATTENTION! State Operators!

Many States are now appointing approved operators to perform safety tests in their territories! If you are located in any of these States you have a chance for this profitable work, if you have approved equipment. Bear Headlight Tester is "Officially Approved" and meets the performance and operating standards required by State law.

BEAR MFG. CO.



Rock Island, Ill.

## TIME FOR BIGGER PROFITS with BEAR "555" HEADLIGHT TESTER

New SEALED BEAM Headlights  
Make Your Profit Opportunities  
Greater Than Ever!

New Sealed Beam Headlights—the most talked-up feature of 1940 model cars—will create a greater demand than ever before for the right kind of headlight testing. Operators of Bear's low cost "555" Headlight Tester will get a big percentage of this profitable business—not only because they have Testers that can do the job right, but also because their service will be advertised to the thousands of car owners who read Bear Service Station advertising in TIME Magazine throughout the year!

Your BEAR SERVICE Now  
Nationally Advertised In TIME  
Magazine!

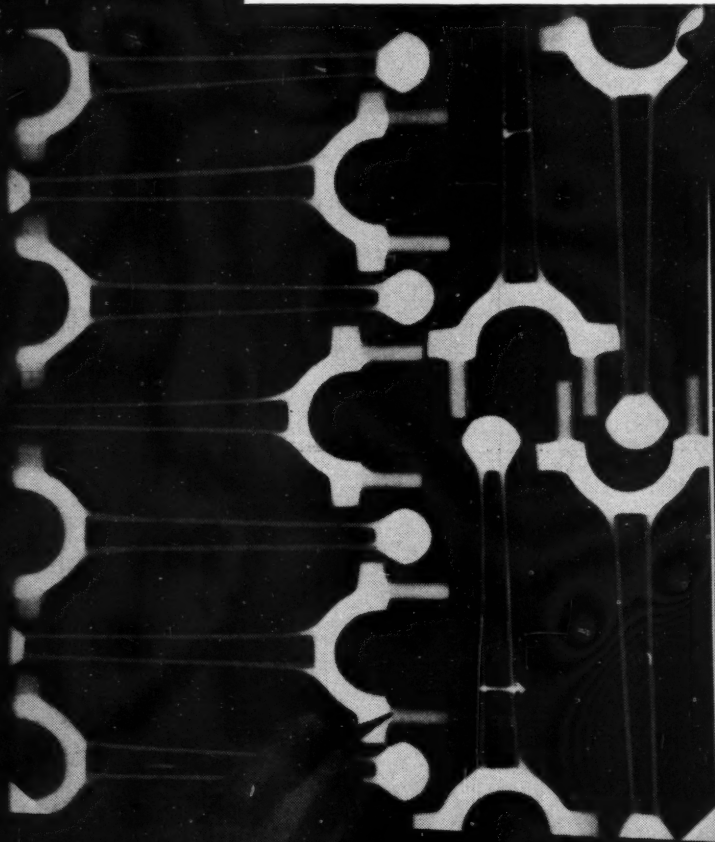
That's why it's "Time For Bear" in your shop. Bear is the first manufacturer of repair equipment to attract the attention of car owners and build bigger profits for dealers with National Advertising! It's your advertising with only one purpose—to increase your business volume and profits!



GET YOUR BEAR  
SIGN UP NOW!

# Have you ever **LOOKED THROUGH STEEL?**

Illustrated is the X-ray picture of a Ford connecting rod. The X-ray machine is operated in a room walled with 8 tons of lead. The operator stands outside a thick lead glass window working the machine from dials outside the room. This machine is a great help to Ford engineers, enabling them to design Ford parts for the greatest strength—to check even the internal structure of steel.



You can't see through a connecting rod. You have to take the manufacturer's word for it that the metal is sound and flawless.

But the Ford Motor Company looks through steel. It uses an X-ray machine—to check up on forgings and castings, before production starts. Many Ford parts are X-rayed during development. This is one reason for their exceptional reliability.



The dependability of Genuine Ford Parts protects your reputation for doing reliable work. And—a satisfied customer is your best assurance of getting more business.

That's why you ought to use only Genuine Ford Parts in your Ford service work. You know that their good performance will back up your good name.

**FORD MOTOR COMPANY**



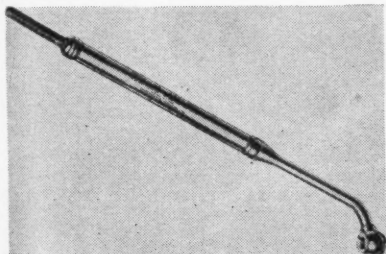


### LASTING

Sixteen years ago, Jan. 2, installation of an experimental 10 by 12 ft. section of rubber block paving was made by Goodyear Tire & Rubber Co. in front of its Akron, Ohio, factory. Current technical examination made by company engineers showed that, despite heavy traffic, the rubber blocks had experienced but slight wear, looked fit for a second 16-year period of service.

### Schrader Tire Gage

A new tire gage to be known as the Schrader Truetest Special has been developed by A. Schrader's Son, 470 Vanderbilt Avenue, Brooklyn, N. Y. It has a new dual-foot feature which makes it practical for use on all types of wheel construction, especially dual-wheels, according to the manufacturer. It has the swivel type indicating bar distinctly marked on all four sides; calibrations range from 10 to 60 lb. in 1-lb. units, and 60 to 160 lb. in 5-lb. units. A special Recalibra-



tion Service Certificate entitles the user of the Truetest Special to send it back to Schrader at the end of the first six months for checking and recalibrating. The second recalibration service should be used within one year thereafter. There is no extra charge for this service, which assures the user continuous accuracy.

### Ramco Holds Convention

The Ramsey Accessories Mfg. Corp. of St. Louis, Mo., makers of RAMCO 10-Up Piston Rings, called practically its entire national sales organization to St. Louis for the week of Dec. 4 for the annual sales convention. With 1939 going into the records as the greatest in point of sales in RAMCO'S 20-year history, the convention held in the Coronado Hotel was the best attended, most enthusiastic ever held by the Ramsey organization.

Highlight of the convention was the announcement by the company of the addition of a new patented Spiro-Seal steel segment to the RAMCO 10-Up Oil Ring, the merits of which were described in detail by the engineers of the company. Another important announcement was that concerning the extension of the RAMCO 10-Up 10,-

000 Mile Guarantee to include all users of the rings.

### Cobb's Record Approved by International Assn.

Six super-speed records established by John Cobb, king of the speed realm, last August at Bonneville Saltbed in Utah, have been approved by the International Association of Recognized Automobile Clubs at Paris, France. Delay in giving final certification to the world land speed records was said to result from the war in Europe.

The International Association is

the world-wide supervising authority of automobile racing and world speed record activity. The Contest Board of the American Automobile Association is the International Association's representative in the United States. Speed activity is directed by the Sporting Commission of the International Association.

The six records approved have been certified to the AAA as follows:

Distance	Miles per Hour
1 kilometer	369.7
1 mile	368.9
5 kilometers	326.7
5 miles	302.2
10 kilometers	283.0
10 miles	270.4

Advertisements in leading Trade Magazines feature sales ideas

Seasonal merchandise deals to increase your sales

Signs, Decals, Flasher Signs. Free to cabinet purchasers

**PUT THIS P.&D. PROMOTION TO WORK FOR YOU in 1940**

Do a real merchandising job this year. » » » Build more sales on ignition parts, wire, cable and tape . . . Attract new customers with this powerful campaign available in 1940. Ask your jobber for full particulars.

Free Tune-up Chart and Window Streamers attract and increase business

Up-to-the-minute catalogs and a binder to keep them in

Trained Service Engineers on call through your jobber

**BE WISE—LET US CHECK your COILS**

**GENUINE P.D. IGNITION PARTS**

**NEWTYPE WIRE, CABLE, TAPE and NOKRODE BATTERY CABLE UNITS**

**P. & D. MANUFACTURING COMPANY, Inc.**

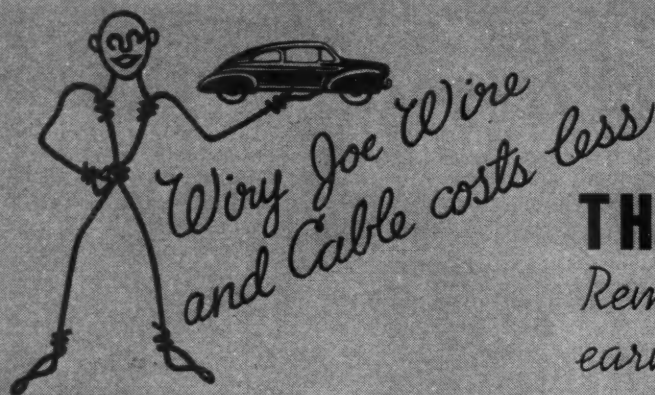
STARTING LIGHTING IGNITION

LONG ISLAND CITY NEW YORK

REPLACEMENT PARTS

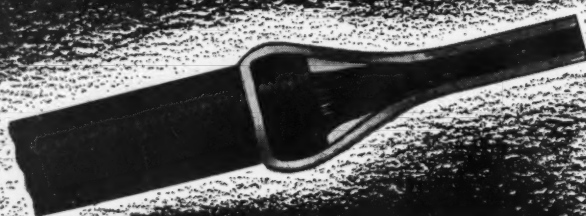
P. & D. Manufactures ONE complete quality line. Only the finest materials and workmanship obtainable are employed.

**YOU CAN NOT PURCHASE ANY FINER QUALITY**



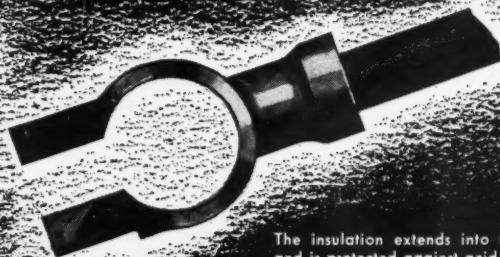
## THAT'S IMPORTANT

Remember, 3 out of 5 car owners earn less than \$30.00 per week



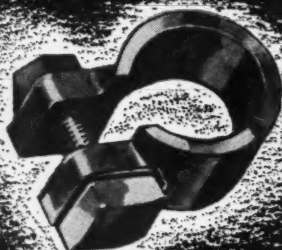
This connection is made of heavy sheet copper stamped to shape under tremendous pressure by a special Wiry Joe process.

It compresses the cable into a solid mass with the copper becoming practically one piece and, therefore, a true copper-to-copper contact for increased conductivity and no electrical loss.



The insulation extends into the terminal and is protected against acid and fraying of yarn, thus adding to life of cable.

Terminal is closed under great pressure, assuring a solid copper-to-copper contact between cable and terminal.



Slot in terminal prevents head of bolt from turning when nut is being removed or replaced.

Eliminates lost time looking for two same size wrenches. Easier to unfasten.



Large size nuts and bolts are used for easier removal of bolt, less bother and the elimination of skinned knuckles—a Wiry Joe means of saving time.



After terminal and connection are fastened to cable they are given a heavy coat of lead—not merely soldered. This protects the brass terminal from acid corrosion.

## Wiry Joe . . . the Top Quality line that you can sell for less

The Wiry Joe Line gives you top quality . . . gives you top quality at low prices that let you reach the great mass market on which you must depend for volume. Everyone wants quality repair work, but most people can afford only moderate costs.

You can sell the Wiry Joe Line for less than other high quality lines in spite of the use of only the finest raw materials and advanced manufacturing methods. The superior construction features of Wiry Joe Battery Cable, typify the fine construction of all automotive wiring made by the Crescent Company.

The lower prices for the Wiry Joe Line are not the result of a temporary condition or distressed circumstances. They are the direct result of the Dostam Method of management and manufacture. Wiry Joe offers you a consistent profit opportunity that you should not overlook. The Wiry Joe Line covers every automotive wiring

need completely . . . and with a minimum inventory. It is priced to the volume market. Get the facts today.

### Wiry Joe

## AUTOMOTIVE WIRING

is produced under the



**DOSTAM METHOD**



THE CRESCENT COMPANY

PAWTUCKET, RHODE ISLAND, U. S. A.  
MONTREAL, CANADA



**Just Published—NEW—Up-to-the-Minute!**

# YOUR INCOME TAX

## HOW TO KEEP IT DOWN

Over  
100,000  
copies of  
**THIS BOOK**  
have  
been sold!


"Your Income Tax," by J. K. Lasser, C.P.A., is new, completely up-to-date, covers every Federal income tax requirement and every change of the past two years. Written in simple, untechnical language, it is the quickest and most accurate help ever devised for income tax payers.

This book will save a great deal of your time, enable you to keep your tax down, and avoid the trouble of later assessments. We offer it on this double guarantee: 1. Look through it. If you do not agree it will be of definite help — return it, your money will be refunded. 2. OR—after you have made out your return with this book's help, if it has not actually saved you time and money, return it then, we will refund its full price to you.

**ACT NOW**—This book is available at all book and department stores . . . or direct from the publishers, Simon and Schuster, Inc.

Dept. 33, 386 Fourth Ave., New York City

1. By knowing each and every deduction to which you are justly entitled.
2. By learning how to prepare your income tax return quickly and correctly . . . thus avoiding future assessments, penalties and interest charges.

 **This Book Includes**

**Check Lists  
of exemptions and deductions,  
to make sure you overlook nothing to which  
you are justly entitled. It contains:**

178 Items Which You May Exclude From Your Gross Income.

75 Different Taxes Deductible by an Individual.

9 Types of Charitable Contributions Which Have Been Approved as Deductions.

225 Deductions Which May Be Made If You Are En-

gaged in a Trade, Business, or Profession.

40 Changes in the law during 1939 affected by statutes, rulings, and decisions.

15 Recommendations as to Security Transactions.

122 Deductions Which May Be Made by Salaried Men and Women.

**Price  
\$1.00**

Completely indexed — with quick guide to each and every line in your tax blank.

SIMON AND SCHUSTER, Inc., Dept. 33,  
386 Fourth Avenue, New York, N. Y.

Please send me immediately . . . . . copies of "Your Income Tax" at \$1 per copy, for which I enclose my remittance. It is understood that if this book does not definitely save me both time and money, I may return it to you and you will refund my money in full at once.

Name .....

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City ..... State .....

Note: If resident of N. Y. City, add 2¢ Sales Tax.

## Midgets Drop AAA

(Continued from page 49)

Rickenbacker, World war flying ace, at the annual meeting of the American Automobile Association, parent organization of the Contest Board, in Washington, D. C., on Nov. 17. Rickenbacker is chairman of the Contest Board and is president of the Indianapolis Speedway.

In defense of the Contest Board, Rickenbacker told the Automobile Association members:

"In an organization having such functions as those of the Contest Board, and which necessitates passing

judgment as to the right or wrong of actions by individuals associated with its activities, and subsequently inflicting such penalties or discipline as the circumstances may warrant, there will inevitably be those who, in support of their own actions, feel that it is necessary to resort, in their recriminations, to the circulation of unfounded and malicious rumors and gossip. It has always been the policy of the Contest Board to reply in such instances to a statement of facts, believing that truth will prevail.

"During the past few months a series of disturbing reports were placed in circulation, and in line with this policy the members of the Con-

test Board made a complete investigation. The results of that investigation have very recently been set forth in a published report, copies of which you gentlemen have probably received. That statement bore the unanimous approval of the members of the Contest Board and, I am happy to say, there has not yet, in the 37 years of its existence, been any taint of scandal or slander to touch the organization even though it has been called upon to handle extremely complicated and delicate problems."

Two of the points in the Contest Board's statement which directly affected midget racing were these:

"A. It has been stated that the Secretary of the Contest Board was financially interested in midget race tracks operating under AAA sanction. An investigation has revealed that the Secretary of the Contest Board is not now and has never had any financial interest in any midget track. However, on Feb. 12, 1939, the Secretary did advance an unsecured personal loan of \$500 to William Heiserman (one of the promoters said to have since notified the Contest Board of his withdrawal from the board's supervision), promoter of midget racing on the Coney Island track. This loan was repaid in full without interest on May 23, 1939. The Secretary explained that the management of the track had become financially embarrassed and was facing foreclosure by midnight of Feb. 12. He understood that the track would be immediately leased to an unsanctioned promoter and advanced the money in order to keep the track in the AAA sanctioned circuit. The Board took the position that whatever the motive, it was an error in judgment on his part to advance money to any operator on any basis.

"B. It has been alleged that subsequent to the above incident, the Secretary of the Contest Board showed partiality toward the Coney Island track as against another track (Cedarhurst) operating in the same area. During the 1939 season, a controversy developed over the question of dates between the Cedarhurst track and the Coney Island track. The dates which caused this conflict, however, had been set in April of 1938, that is, ten months before the loan was made. Following regular procedure, the controversy over conflicting dates was submitted to the Sanction Committee of the Board on June 9, 1939, and on June 13, with all parties to the controversy present, the Committee decided against the Coney Island track and restricted its operations to one night a week."

In a preface to the Contest Board statement, Rickenbacker wrote:

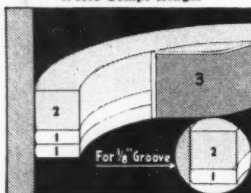
"As chairman of the Contest Board I have interested myself in this problem, as have all of my associates on the Board who have joined with me in a searching investigation into all rumors, from whatever origin or by whatever motives they were inspired.

"While it is difficult to track down all of the allegations, we have collected enough to warrant the issuance of a statement of the allegations and the facts and this statement is issued in the interest of maintaining the integrity of the Board and with the unanimous approval of the members of the Contest Board."

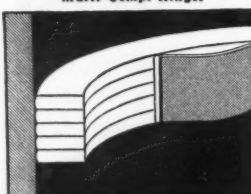
## Precision-Built for the Motor Specialist



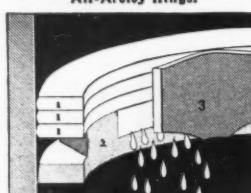
Welco Comp. Rings.



Multi-Comp. Rings.

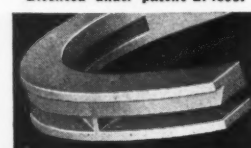


All-Aroloy Rings.



Dran-Bac Oil Rings.

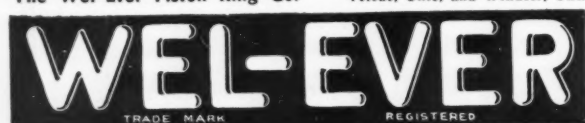
Licensed under patent 2148997



Bevl-Chanl Oil Rings

MAND Wel-Ever Sets. Your Jobber can get them if he hasn't them and if you insist upon them! Don't be Satisfied with less! Send for literature.

The Wel-Ever Piston Ring Co. Toledo, Ohio, and Windsor, Ont.



Wel-Ever Sets are not "hit or miss" cure-alls. They are Engineered Sets—Engineered to the individual motor, its cylinders and the ring grooves on its pistons—PRECISION BUILT at the factory for the man who prides himself on his piston ring jobs.

### Guesswork Taken OUT

To choose the correct Wel-Ever Set all that need be known is make of motor and year made, whether cylinders are worn, badly worn, or if rebore is necessary.

### Maintains Reputation of the Motor Specialist

Wel-Ever Sets do the job and do it RIGHT the first time without comeback because they are MADE that way. They satisfy the motor specialist because they satisfy the car owner. They fit the job because they are individualized to the motor, cylinders, pistons and ring groove depth and width.

there's a  
**WEL-EVER**  
TRADE MARK REG.  
Set for each  
ring job....

### For 1st Re-Ring For 2nd Re-Ring For Rebore Jobs

"H" SPECIAL SET  
1 Welco Comp.  
1 Multi-Comp.  
1 Dran-Bac.  
1 Bevl-Chanl.

"D" SUPER SET  
1 Welco Comp.  
1 Multi-Comp.  
1 All-Aroloy.  
1 Dran-Bac.

"BW" SET  
2 Welco Comp.  
2 Bevl-Chanl.



All Sets complete with rings for all grooves. Ask for and DEMAND



# HEIN-WERNER Scores Again...!

Model "OS"

## O'BOY WITH SWIVEL WHEELS

and swivel saddle... only

**\$19<sup>95</sup>**

Net to Dealer  
(West Coast \$20.95)

← Easy-to-spot  
White  
Saddle

Quick  
Removable  
Handle→



**IN ADDITION  
TO THE MODEL  
"O" HYDRAULIC  
SERVICE JACK  
at \$17<sup>45</sup> net to dealer**

Hein-Werner introduces the NEW MODEL "OS" O'BOY Hydraulic Service Jack with swivel wheels and swivel saddle. The dealer price is only \$19.95 (West Coast \$20.95)—and this jack is the *greatest value* ever offered by Hein-Werner.

This sensational new jack is the same construction as the universally popular Model "O" O'BOY except that the Model "OS" has swivel wheels and swivel saddle... Has 2,500 lb. capacity... Saddle high point 17<sup>13</sup>/<sub>16</sub>"... Saddle low point 4<sup>5</sup>/<sub>16</sub>"... Shipping weight, in fibre carton, 69 lbs.

Quick removable handle on both the Model "O" and "OS" makes these jacks ideal for use on the road or in the shop or service station. Handle can be removed instantly and jack put into service car and taken out on a road job.

**NEW 3,000 LB. CAPACITY MODEL  
"WS" ALSO HAS SWIVEL WHEELS**

In addition to the Model "OS" (illustrated) and the Model "O", Hein-Werner line for 1940 includes the NEW MODEL "WS" Hydraulic Service Jack. It is the same as Model "W" except that it has swivel wheels and swivel saddle... Capacity 3,000 lbs... Saddle high point 20"... Saddle low point 4<sup>1</sup>/<sub>2</sub>"... Dealer price, \$28.50 (West Coast \$29.95).

## New Model "1.30" Bumper-Lift Hydraulic Jack for those who prefer a passenger car jack with hydraulic pump at the top!...

Compact, powerful, leak-proof hydraulic unit is built into the top of the new Model "1.30". Handle, operating *above* the bumper of the car, makes it easy to raise load *quickly* and *safely*... Universal hook fits under bumper arm of practically all 1940 cars, as well as older cars... Capacity 3,000 lbs... Dealer price, \$4.45 (West Coast, \$4.85).

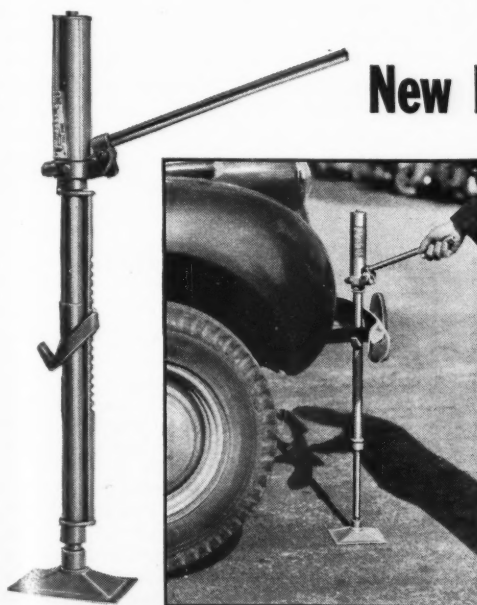
The complete Hein-Werner line for 1940 also includes Models "1.18A" and "1.21A" Bumper-Lift Hydraulic Jacks for modern passenger cars, 1½ and 2 ton

capacity hand jacks for cars and light trucks, 3, 5 and 8 ton capacity jacks for trucks, and 12 and 20 ton capacity jacks for trucks and buses.

Ask your H-W Jobber, or write us for details

**HEIN-WERNER MOTOR PARTS CORP.**  
Waukesha, Wisconsin

FEW MODELS ENGINEERED TO DO THE WORK OF MANY  
**HEIN-WERNER**  
*hydraulic JACKS*



## Legally Speaking

(Continued from page 46)

in the building by the tenant. In connection with his business the tenant installed in the leased building certain equipment which was attached to the building by pipes and wiring. One piece of equipment was attached to the building by belting. When the lease was terminated the landlord claimed that this equipment belonged to him as part of the real estate. The landlord contended that the installation of the equipment con-

stituted "additions, alterations or improvements" and hence belonged to him in accordance with the terms of the lease. This equipment, he pointed out, was not "movable furniture."

"We are convinced, from a reading of the lease," said the Federal court, "that the parties had in mind the equipment being installed by the tenant when they provided for a removal of the movable furniture put in at the expense of the tenant. Otherwise it would be difficult to understand why any reference to furniture should have been made in the lease. It seems to us that the words movable furni-

ture shall be deemed as synonymous with the words movable fixtures as distinguished from fixtures which are so fixed to the realty that their removal would deface or injure the walls, ceilings or floors."

The court arrived at this decision in favor of the tenant by interpreting the meaning of "movable furniture" in the light of other provisions in the lease. A repairman operating in a rented building should make sure that his lease fully protects him with respect to all equipment and other installations in the building made at his expense.



Today your tire valve is actually an extension of the inner tube... really the most vital part of the tube because it contains the air control mechanism. The rugged casing, or tire, which absorbs the wear and tear of road contact, provides no protection at this vulnerable point. Damage *within* this exposed portion of the tube can ruin a costly tire and cause annoying and expensive roadside delays.

That's why Schrader always provides the valve mechanism with the protection of an air-tight valve cap. While valve caps shut out dirt, they are more than "dust covers". Designed to *seal* the opening of all standard tire valves on the smallest pleasure car or giant truck or bus. You will find Schrader Valve Caps air-tight up to 250 lbs. pressure.

## Schrader TIRE VALVE CAPS

Schrader Air-Tight Caps Banish Tire Valve "Slow-Leak" Worries

A. SCHRADER'S SON Division of Scovill Manufacturing Company, Incorporated BROOKLYN, N. Y.

1. Valve cap body or shell.
2. Swivel plate allows cap shell to turn independently of rubber washer as cap is applied. This assures proper seating of washer and prevents distortion.
3. Reinforcing plate provides a chamber for safe clearance of valve core pin.
4. Molded rubber washer seals valve mouth when cap is screwed down firmly by hand.

## Retail Price Maintenance Again

ONCE more litigation under the retail price maintenance laws has been before the courts, this time in a Federal District Court in Minnesota. A manufacturer who had fixed retail prices on his products under the retail price maintenance law brought action against a retailer who was alleged to be selling the manufacturer's trademarked articles for less than the fixed prices.

One of the interesting features of this particular case was the fact that it was not shown that the items sold below price by the retailer were acquired by him after he was notified of the manufacturer's fixed price agreements within the state. The court made an order restraining the retailer from selling below the manufacturer's fixed retail price, but specified that the order applied only to such items as the retailer acquired after he had received notice of the manufacturer's fixed retail price agreements.

The retailer in this case claimed that other retailers were selling below the fixed price and that the manufacturer had taken no action against these other offenders. While the court did not consider this an excuse for price cutting, it nevertheless said:

"While the wrong-doing of other retailers is no defense of wrong-doing on the part of this retailer, if discrimination is practiced in the acquiescence of the manufacturer in violations of its contracts by other retailers, a situation would be created depriving the manufacturer's cause of equity."

## Breaker Points

(Continued from page 44)

of the full face of the rubbing block—only one edge is enough.

This will be more readily understood by reference to Fig. 1, which shows at F, for example, that only one edge of the block is in contact with the cam surface.

Always check the primary connections in the ignition system. Loose joints, broken or frayed wires, etc., cause high resistance or voltage drop and may seriously impair work of the breaker points and other units upon which depends the ultimate spark in the cylinders.



## Bob Swanson Heads Pacific Coast Midgeteers

Bob Swanson, headline driver of the Pacific Coast for several years now, received \$444.96 for winning the midget auto racing title of that section for 1939, it was announced at headquarters of the American Automobile Association's Contest Board in Washington, D. C.

Swanson's award came out of the Point Bonus Fund at Gilmore Stadium, Los Angeles. Five drivers and five car owners in both the "A" and "B" class competition shared \$3,476.32.

Following is the complete standing of the Pacific Coast Midget Championship for 1939, listing the "A" class drivers:

Position	Driver	Points
1	Bob Swanson	2,237.2
2	John McDowell	1,846.7
3	Roy Russing	1,768.1
4	Danny Oakes	1,618.8
5	Fred Friday	1,292.9
6	Lewis Foy	1,197.0
7	Sam Hanks	1,086.1
8	Gordon Cleveland	1,050.0
9	Karl Young	735.0
10	Andy Guthrie	732.3
11	P. Distarce	691.9
12	Pat Cunningham	656.0
13	Paul Pold	623.9
14	Mel Hansen	547.0
15	Joe Allen	345.9
16	Paul Swedburg	258.0
17	Louis Ulbrich	247.8
18	Sport Briggs	232.2
19	Perry Grimm	211.9
20	Duke Nalon	182.5
21	Wally Zale	160.6
22	Paul Russo	159.8
23	Duane Carter	125.4
24	Louis Durant	71.3
25	Mutt D'Amore	70.9
26	Bob Duncan	66.0
27	Fletcher Pierce	63.1
28	Bud Lewis	62.3
29	Ted Tracy	60.6
30	D. W. McCauley	59.9
31	Reynold Coleman	59.0
32	Bert Lustig	55.0
33	Spider Webb	45.0
34	Lane Curry	34.4
35	Lyle Dickey	29.6
36	Ronney Householder	28.9
37	Harry Hart	24.4
38	Rex Mays	10.4
39	Bud Crawley	9.7
40	Cal Niday	9.4
41	Fred Hartman	7.7
42	Ed Haddad	1.0

The first 10 in the "B" standing were:

Position	Driver	Points
1	Bud Lewis	192.7
2	D. W. McCauley	174.8
3	Louis Ulbrich	157.6
4	Bob Duncan	141.9
5	Fletcher Pierce	140.7
6	Sport Briggs	98.6
7	Gordon Cleveland	80.8
8	Paul Pold	80.3
9	P. Distarce	76.6
10	Bert Lustig	74.4

## C. W. Spicer

Clarence W. Spicer, founder and vice-president of the Spicer Manufacturing Corporation, Toledo, Ohio, and widely known for his contributions to automotive engineering, died recently. He was 64 years old.

It was while he was at Cornell University that he began experimenting with automotive devices, inventing the Universal Joint. Immediately upon

leaving college he began the manufacture of the joint. In 1905 Mr. Spicer organized the Spicer Universal Joint Co., of which he was named president. In 1915 the company was reorganized as the Spicer Manufacturing Corp. and the company's founder was selected its vice-president.

Closely identified with the development of the automotive industry, Mr. Spicer was one of several engineers who designed the Class B Liberty Truck for the wartime use of the U. S. Army. He perfected the hydraulic press type of push broaching for square and multiple splined holes and made many other contributions to the advancement of the industry.



## Save Steps, Time & Money— Take This "HALLOWELL" SEMI-PORTABLE STEEL WORK-BENCH RIGHT TO THE JOB!



Fig. 992

Drawer is extra

Combine the advantages of "Hallowell" steel construction with movability and you have an ideal work-bench for automotive repair and service work. The semi-portable model shown above is as convenient as could be . . . just push it from job to job with the two handles which swing safely out of the way when not in use. And its smooth steel top can't splinter or become oil-soaked as will wood benches. Write for catalog giving full information about this and 1367 other "Hallowell" Steel Bench combinations. You're sure to find those that belong in your shop.

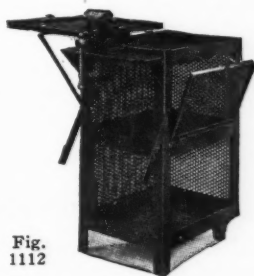


Fig. 1112

## And Keep Tools Handy in "HALLOWELL" STEEL TOOL STANDS

At left is a sturdy cabinet type stand, totally enclosed, but allowing visibility of contents. Tools can be locked up to prevent "borrowing", and stand is semi-portable.



Fig. 705

At right is an open type stand which keeps tools handy and in order, eliminating the confusion of old-fashioned, traveling tool boxes. Goes right to the scene of the job, too. Send for details and prices.

## STANDARD PRESSED STEEL CO.

BRANCHES

BOSTON  
DETROIT  
INDIANAPOLIS

JENKINTOWN, PENNA.

Box 561

BRANCHES

CHICAGO  
ST. LOUIS  
SAN FRANCISCO

# Work a MIRACLE for 'Em!



When you get a motor with low compression, sticky valves, hogging fuel and lazy on power, you've got a chance to work a "miracle" and collect immediate profit plus real customer goodwill.

Nine out of ten times, it's sludge that's doing the damage. Ten times out of ten—

## MAGNUS MET-AFFIN

will purge the sludge quickly, completely and economically, with astounding improvement in motor performance.

And, if you'll see that the owner uses a couple of ounces of MET-AFFIN to every quart of oil he puts in his car, he'll never have sludge again.

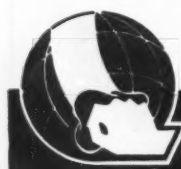
What MET-AFFIN does is to disperse into fine, easily evaporated droplets the water of condensation in the lube oil. Sludge is chiefly formed as a result of the collection and retention of the water in the crankcase.

## MAGNUS CHEMICAL COMPANY

Manufacturers of Cleaning Materials, Industrial Soaps, Metallic Soaps, Sulfonated Oils. Emulsifying Agents and Metal Working Lubricants.

36 South Avenue

Garwood, N. J.



## MAGNUS CLEANERS

## CHARLOTTE SOUTHERN

(WOMAN DRIVER)



**SOUTHERN**  
FRICTION MATERIALS CO. - CHARLOTTE, N.C.

## Merchandising Aids

(Continued from page 29)

able information of interest to all battery dealers and motorists. The association will mail these upon receipt of cash order, at 10 copies for \$1, postpaid.

The K-D Lamp Co., Cincinnati, Ohio, is distributing their copyrighted Summary of I.C.C. Rules and Regulations. The 1940 edition of the I.C.C. charts is illustrated by drawings which show exactly how the various required lighting of the I.C.C. should be installed on each kind of vehicle. In addition, the chart shows individual state requirements. Copies will be sent without charge upon request to The K-D Lamp Company, Cincinnati, Ohio.

## Fords First in

## Argentine Race

Ford cars scored a victory in the 1939 running of the Argentine Grand Road Race by taking the first four places and setting a new speed mark

for the strenuous classic. Five other Ford cars finished in the first 10, the Ford Motor Co. reports.

Because road and weather conditions this year were even more adverse than those customarily encountered in this most keenly-contested of all South American road races, the original 4314-mile route was abandoned after two of the 10 scheduled laps had been run. A 2747-mile route to be run in seven stages was substituted, and a new start made, with the race renamed the "Gran Premio Argentino Extraordinario 1939."

First place was captured by Oscar Galvez, who averaged slightly over 61 miles an hour in his Ford V-8 for the entire route. Three other Ford cars followed him across the finish line in LaPlata before another make came in, followed by five more Fords.

Ford cars won all but one of the seven laps, with Galvez setting the most blistering pace of the entire race when he dashed from San Juan to San Luis, a distance of 278 miles, in 3 hr. 36 min. for an average 77.3 miles an hour. Equally impressive was the speed on the long final haul from Bahia Blanca to LaPlata, a distance of 447 miles. Fords finished this lap in one-two-three order, the first of the group having negotiated the distance in 5 hr. 51 min., an average of 76.3 miles an hour.

The extremely difficult character of the contest is reflected by the fact that only 44 cars finished the run.

## AJAX

A JACK FOR EVERY  
AUTOMOTIVE NEED

AJAX AUTO PARTS CO.  
RACINE, WISCONSIN



The finest warning signal made—Musical, but powerful—Instant Response, but delicate when desired.

Sound Range 1 to 10 Miles  
New Remote Controlled Spot Light Ready.  
Avoids drilling car body.

Write for literature  
**BUELL MANUFACTURING CO.**  
2983 Cottage Grove Ave., Chicago, Illinois

## FOR THE OIL GASOLINE & WATER CONNECTIONS VELLUMOID

## Cut or Tap Out Quality Gaskets from Sheet VELLUMOID

VELLUMOID Gaskets go on without shellac, and make positively tight connections you can rely on.  
**THE VELLUMOID CO., WORCESTER, MASS.**





**ALL WAYS**

● Made only of the best materials . . . by modern methods exclusive with this company . . . Gardiner Acid-Core Solder assures the dependable results, maximum economy and consistent performance so important to car manufacturers, body builders, garages and repair shops.

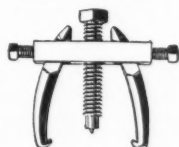
Its quick-acting flux permits fast, clean work. Unusually high tensile strength insures lasting bonds. Yet Gardiner Solder costs less than "nameless" solders that lack its advantages of high quality and dependability.

The Gardiner quality line includes Acid and Rosin-Core Solders, Solid Wire, Bar and Body Solders . . . also Permanent Lining Babbitt metal. For best results . . . always and all ways . . . specify Gardiner-made products.

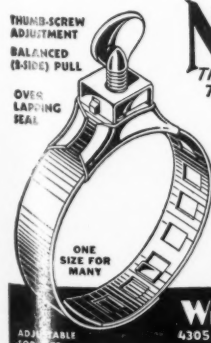


## PULLERS

ALL KINDS—ALL SIZES  
ALL PRICES



NATIONAL MACHINE &  
TOOL CO., JACKSON, MICH.



TRADE MARK  
**Noc-OUT**  
THE HOSE CLAMP WITH  
THE THUMB SCREW

Seals absolutely against leakage of anti-freeze, radiator connections, or heater hose. Type A, Adjustable, the clamp with the thumb screw, 1 size fits many. Type GHH for heater hose. Type GBB for booster brakes.

**WITTEK MFG. CO.**  
4305 W. 24th Pl., Chicago, U.S.A.

## NEWSTOON



A disappointed thief in Uhrichsville, Ohio, not long ago stole a worn out spare tire from Mayor J. W. Lytle's automobile—then returned it when he discovered that even he could not use it. The mayor reprimanded the police for allowing the thief to return it.

## NAPA Revives Jobber Play

"E. D. Jobber," whose business is intimately known by his fellow jobbers from coast to coast as the result of its dramatization in the National Automotive Parts Association Regional Conferences of 1938, is starting out in Minneapolis on Feb. 19 to renew old acquaintances and make many new ones. That is the date when the NAPA Regional Conferences of 1940 open for a series of visits to 21 cities in all sections of the country, following the NAPA policy of taking the show to the jobber, and to his organization, as well. Manufacturers of NAPA lines, while not having parts in the play, will be in attendance at each conference meeting, the same as in former years.

"The dramatized version of the troubles that beset so many jobbers, and the way in which NAPA can be of assistance, attracted such widespread and favorable attention in our last regional conferences, that there could be no doubt in our minds as to the course which we would pursue this year," said Henry Lansdale, vice-president and general manager of the National Automotive Parts Association. "The limitations of time in any one meeting of this kind were such that we could tell only part of the NAPA story in the last Regional Conference, and the dramatization which is the keynote of the 1940 Conferences takes up the story where the last one left off."

## Tractor Chain

The American Chain Division of American Chain & Cable Co., Bridgeport, Conn., has a new Weed spiral grip farm tractor chain. It is designed with right and left spiral links to prevent any tightening up, and features a zig-zag cross chain arrangement which is said to effect maximum traction and smoother riding with minimum vibration.

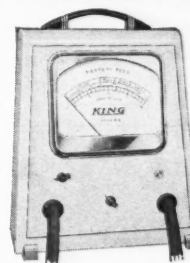
## New "KING" Unit that combines the EXHAUST GAS ANALYZER R.P.M. INDICATOR CAM ANGLE METER for only \$120.00



The "KING" Type BG-46 Tester is a practical and useful unit that is attractively priced. It has a large 9" meter that is extremely sensitive and very accurate—a simple switch arrangement permits its use for all the tests. You can make exhaust gas tests easily and quickly—show your customers that they are wasting gas and also show that waste has been stopped. The Electro-Tach (or R.P.M. Indicator) indicates increased R.P.M. after proper tune-up has been made. The Cam Angle Meter can be used on the car with engine running at any speed and will quickly detect trouble in points or mechanism.

**SOLD ON DEFERRED PAYMENTS**

## New BATTERY Tester has IMPROVED features

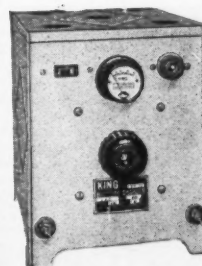


The New "KING" B-3 Battery Tester is simple to operate and easy to understand. It has a large 9" extremely accurate meter which has a scale showing percentage of plate, capacity of the battery under test and also indicates voltage of each cell. It makes accurate comparison readings on 11 to 21-plate batteries. This New

"KING" Battery Tester with IMPROVED features is an outstanding value at \$48.50.

## "KING" \$25.00 BATTERY CHARGER Less Tube

The "KING" Special-12 Battery Charger is a real buy at \$25.00 less tube. It has the well known "KING" features that are responsible for the reputation "KING" Battery Chargers have for giving years of trouble-free service. It will charge from one to twelve 6-volt batteries at a 6-ampere rate. We make a complete line of Battery Chargers, also a compact Charging Rack that takes up very little room.

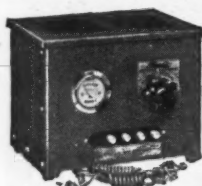


"KING" Special-12

Ask your Jobber or Write us Jobber's Name

The **ELECTRIC HEAT CONTROL CO.**  
9123 INMAN AVE. CLEVELAND, OHIO  
**"KING" Good Products Since 1914 "KING"**

## Handy BATTERY CHARGERS



New, improved ventilation—cool, low-cost operation and longer life. 2 YR. GUARANTEE. Get Bulletin 68 on Complete Line. At left, 12-Batt. Size less bulb  
**\$28.00**  
BALDOR ELECTRIC CO.  
4375 Duncan Ave.,  
ST. LOUIS, MO.

## BUY FROM YOUR JOBBER ON THE "ONE-CONTRACT" AUTOMOTIVE EQUIPMENT PLAN

Insurance



Included

**COMMERCIAL CREDIT COMPANY**  
Baltimore

MILES OF SMILES!



On  
**TIMKEN  
BEARINGS**

THE TIMKEN ROLLER BEARING CO.  
CANTON, OHIO

FOR —  
**AUTOMOBILES  
TRUCKS  
TRAILERS  
AND  
BUSES**

## MOTOR AGE

—is a publication keyed directly to the needs of the maintenance field. Built on the requirements of the serviceman. Edited by Bill Toboldt. Read it every month.

A Chilton Publication  
CHESTNUT AND 56TH STS.  
PHILADELPHIA, PA.

**BUY**



THIS GENUINE 1/2" SPEEDWAY DRILL **\$24.50**

- At The Lowest Prices Ever Made On A Quality Drill of This Size
- High Torque Speedway Motor
  - Air Cooled Die Cast Case
  - Natural Grip Direct Thrust Breast Plate Handle
  - Removable Side Handle for Close Quarters
  - Self Aligning Oilless Bearings
  - 500 R.P.M. Operating Speed
  - Smooth Sliding Thumb Switch
  - Beautiful 2-Tone Finish

Complete with hand operated 3-jaw 1/2" chuck, rubber covered cord, unbreakable plug.

Write for Circulars and name of nearest dealer.

**SPEEDWAY MFG. CO.**  
1880 S. 52nd Ave., Cicero, Ill.

## Registrations for '39 Set New Record

Total U. S. motor vehicle registrations for 1939 will establish a new all-time record, approximating 30,409,596 cars and trucks, according to a preliminary survey just completed for MOTOR AGE by Marcus Ainsworth, staff statistician. Total registrations for motor vehicles in the 48 States and the District of Columbia totaled 29,428,971 for the year 1938, making the indicated increase for the past year nearly a million units.\*

Previous high tide on registrations came in 1937 which saw the registration of 29,649,270 units, after a seven-year interval of marking time from the 1930 record of 26,657,072 units.

Of the 30,409,596 vehicles registered this year, 26,106,771 are passenger cars and 4,302,825 are trucks and buses. Passenger cars show an approximate increase over last year of 3.2 per cent, while commercial vehicles gained 3.7 per cent. New York maintains first place with 2,642,994, California second with 2,597,536, Pennsylvania third with 2,067,321. The remaining States with over one million registrations are Ohio, Illinois, Texas and Michigan in the order named.

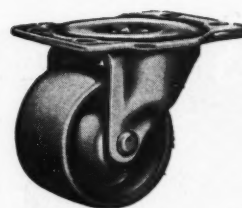
Florida shows the greatest percentage of increase with 11 per cent gain, Maryland is second with 8.2 per cent, Georgia third with 8 per cent, followed by Texas and Utah with approximately the same percentage increase 6.8 and 6.7 per cent respectively. Nebraska has about the same registrations as last year, while New Mexico and West Virginia register slight losses of 0.6 and 0.3 per cent. However, final figures, which will be published early in 1940 might wipe out these losses so that all States will show an increase.

During the past decade total registrations declined from 26,657,072 in 1930 and 23,849,932 in 1933. Other than a very slight decline during 1938 from 1937, each year has registered a material gain over the preceding year since the low of 1933. Despite the large number of cars that have been junked or taken out of service during the years since 1933, over six and a half million more cars have been registered or an average of approximately one million gain for each year.

It is becoming increasingly evident that this continued gain in total registrations is due to longer life rather than to substantial increases in sales of new vehicles over those vehicles going out of service. This is substantiated by the survey on life of automobiles which appears in *Automotive Industries*, for Feb. 25, 1938.

\* This survey is made possible through the cooperation of the motor vehicle commissioners of the various states and is based on actual returns to date plus an estimate by the motor vehicle commissioners for the remaining weeks of the year. The total estimate is based on returns from 39 out of the 48 states and the District of Columbia.

The preliminary estimate indicates a gain over 1938 of 980,000 units or 3.5 per cent. (In this survey we endeavor to lean on the conservative side though sometimes we err in our estimate of those states from which we receive no returns. In the estimate for 1938 we were on the optimistic side to the extent of three-tenths of one per cent or, in round figures, 105,000 units. Based on this estimate 30,409,596 cars,



**HULBERT'S  
No.  
888**

**Creeper Casters  
Stand Up!**

**SET OF FOUR**

**Net Price**

**\$1.25**

Sold by All Leading Jobbers

**HULBERT CREEPER CO., ASHTABULA, OHIO**

Made for HULBERT'S Smash-Proof Creepers, but will fit most brands. 1 1/2" iron wheels — 1 1/16" wide — over-all height 2 1/4". Equipped with thread guards and wheel spanner bushings. Permanently oiled axles.

**HOP ON THE  
"WALKER  
WAGON"  
FOR A ROARING '40!  
WALKER JACKS • LIFTS  
and EXHAUST SILENCERS**

For running-in new and rebuilt engines use auxiliary lubricants containing "dag"\* Brand colloidal graphite.

**Acheson Colloids Corporation**

Port Huron



Michigan

\*REG. U. S. PAT. OFF.



35,000,000 PEOPLE MONTHLY SEE

**Grey-Rock  
BALANCED BRAKES  
ADVERTISED IN THE WORLD'S  
GREATEST MAGAZINES**

trucks and buses will be registered during 1939 as compared with the 29,428,971 that were registered during 1938.

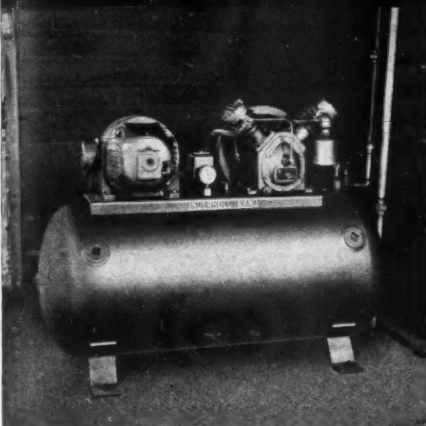
## McCord Promotes Schank

The appointment of Harry E. Schank to the position of chief engineer of the McCord Radiator & Mfg. Co. has been announced by J. H. Cooper, works manager.

Mr. Schank joined the McCord organization in 1922 as research engineer and since early in 1938 has been in charge of radiator design and development. As chief engineer he will direct the engineering of all products in the McCord line.



It's a  
*Beauty*



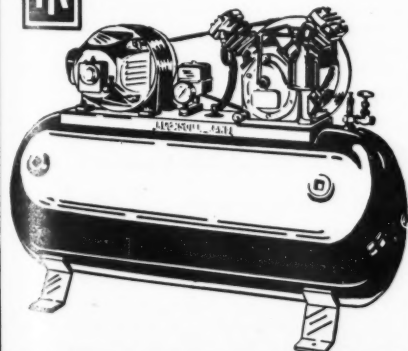
You can be proud of an Ingersoll-Rand Type 30 two-stage compressor. It is painted a flashing metallic blue-grey — and will add to the appearance of your shop or service station.

Furthermore, the beauty is more than skin deep. It will give you years of trouble-free operation with the lowest possible operating costs.

It occupies the same position of leadership in the small compressor field that large I-R compressor units have occupied in other fields for two-thirds of a century.

Sizes 1/4 to 10 hp.—Ask the I-R jobber about them.

752-3



**Ingersoll-Rand**

BROADWAY, NEW YORK, N. Y.

**I-R JOBBERS EVERYWHERE**

*By Gosh! She did it!*  
*-2½ times faster*

### Right in the Groove

Cutting speeds that permit operation of modern production hacksaw machines at top efficiency are being reached in many plants with Atkins Silver Steel Super-Power Blades. On even toughest jobs these new blades have broken record after record for cutting more metal faster, and more accurately... Prove them in your own shop. Try one or more. Discover how low-down the "cost per cut" can really be!



**ATKINS** *Silver Steel* **SAWS**

"FOR EVERY CUTTING JOB ATKINS HAS THE EDGE"

E. C. ATKINS AND COMPANY, 423 S. Illinois St., Indianapolis, Indiana

### NEWSTOON



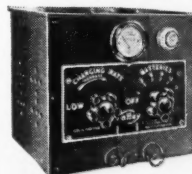
John Murphy of Charlotte, N. C., got himself in a jam recently just because he was too quick in obeying the law. When a siren sounded, Murphy stopped his car so suddenly that the police rammed him in the rear.

### Wheel Suspension Replacement Part

In addition to the usual line of automobile leaf springs, William & Harvey Rowland, Inc., Frankford, Pa., will exhibit for the first time at the A.S.I. Show a complete line of wheel suspension replacement parts. They will also exhibit a line of replacement king

bolts and bushings, tie rod bolts and bushings, shackle kits for Ford cars, tie rod and drag link sockets and other steering and front end parts.

### Don't Pay More!



Don't Accept Less  
Valley Battery Chargers quickly repay their low first cost in added profits to your shop. Guaranteed for two years.

Model G-12 charges 1 to 12 6-volt batteries.

**NOW ONLY \$25.00**

Other sizes at equally low prices. Write for FREE bulletin.



**Valley Electric Corp.**

4221 Forest Park Blvd. • St. Louis, Mo.

*For Seals of Security*

*Industry depends on...*

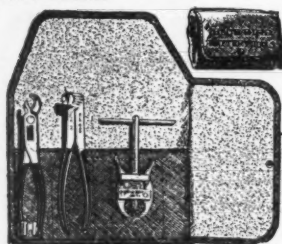
**VICTOR**

GASKETS, OIL SEALS, GREASE RETAINERS

## BLUE BIRD BATTERY SERVICE TOOLS

**Make  
BETTER SERVICING  
Easier**

Save time and increase your profits  
with quality tools designed for  
specific tasks.



An efficient combination of SUPERIOR  
Battery Tools that insures Ease, Speed  
and Better Connections, assembled in a  
Leatherette Kit Bag.

No. 375—3 Piece Kit contains one  
each

No. 11 Hex Nut Plier & Post  
Cleaner

No. 20 Clamp Spreader &  
Cleaner

No. 21 Universal Clamp Lifter  
Price: \$3.00 Postpaid East of Rockies  
\$3.75 Postpaid West of Rockies

**No. 375 KIT Illustrated**

No. 385—4 Piece Kit contains one  
each

No. 52 Super Grip Plier

No. 20 Clamp Spreader and  
Cleaner

No. 21 Universal Clamp Lifter

No. 22 Post Cleaner

Price: \$3.10 Postpaid East of Rockies  
\$3.85 Postpaid West of Rockies

**Ask your Jobber or remit direct  
Jobbers—Write for catalog & proposal**

**BERGMAN TOOL MFG. CO.**

Niagara St., Buffalo, N. Y., U. S. A.

## Midget Sockets

*by Herbrand*

Herbrand "Van-Chrome" midget  
sockets, handles and attachments are  
among the latest additions to the  
complete line of tools manufactured  
by The Herbrand Corp., Fremont,  
Ohio. These tools are designed for  
easily handling small nuts, even in  
close quarters, and are said to be



ideal for service work on magnetos,  
generators, carburetors, radios, re-  
frigerators, wiring connectings, etc.  
The sockets are hot forged from  
chrome molybdenum steel, have thin  
straight walls, and are for 1/4-in.  
square drive. Chrome nickel plates  
with polished side walls. Available in-  
dividually, or in sets.

## Toledo Adds New Lines

To round out its already extensive  
line of motor and chassis parts, the  
Toledo Steel Products Co., 3300 Sum-  
mit Street, Toledo, Ohio, has added  
two new lines of replacement parts.

One is a range of slip-in engine  
bearings of the type used by many  
truck and passenger car builders as  
original equipment. The other is a  
line of independent front wheel sus-  
pension parts.

These two lines offer profit opportu-  
nities for the jobber, and enable the  
repairman to make parts replace-  
ments with a minimum delay in ob-  
taining parts.

## \$3,000 a Year on a Five-Foot Counter

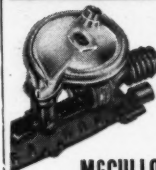
*Display Boosts Business for Minnesota Repairman*

For many of the 20 years Benja-  
min Anderson has operated a repair  
garage in Pequot, Minn., his counter  
business was practically nil. The town  
people preferred to make their pur-  
chases in larger cities within 50 miles  
of his shop and he was content to  
leave their accessory business slip  
away. However, one day he decided to  
do something about that end of his  
business.

The first thing he did was to install  
modern steel shelving around the rear  
wall of his store where he installed a  
good line of parts and accessories for  
popular makes of automobiles. Then  
he displayed samples of his wares in  
his window, each article plainly priced  
and each article representative of the  
best quality of its kind available. He  
avoided the cheap variety of goods  
and held to quality and service. What-  
ever profit the venture would bring  
would be a net gain, as he expected to  
continue to attend to business the  
same as before. Thus no extra help  
was involved and his initial invest-  
ment was relatively low, approxi-  
mately \$2,500 for fixtures and stock.

## GO McCULLOCH SUPERCHARGED

FOR FORD V-8  
MERCURY  
FORD TRUCKS



Here is your opportunity to  
make real money from two  
rich markets—Ford V-8 and  
Mercury passenger cars  
and Ford V-8 Trucks. The  
McCulloch Supercharger  
steps up power, increases  
torque, assures substantial  
gas savings, quiet, smoother  
performance, and longer en-  
gine life. Easy to install. You,  
too, can reap profits from  
those who—Go McCulloch  
Supercharged in 1940.

**MCCULLOCH ENGINEERING COMPANY**

3221 N. 31st STREET • MILWAUKEE, WISCONSIN

## ★ WEED AMERICAN BAR-REINFORCED TIRE CHAINS

*the most necessary  
winter accessory*



AMERICAN CHAIN & CABLE  
COMPANY, INC.  
Bridgeport • Connecticut

## New Tri-Tone Horn

E. A. Laboratories, Inc., 696 Myrtle  
Avenue, Brooklyn, N. Y., has added to  
to its line of horns and heaters the  
New Tri-Tone "Moled-EA" horn, a  
combination of three differently toned  
horns mounted together on a univer-  
sal bracket. The Moled-EA is adapt-  
able for dash, cylinder head or radi-  
ator support rod mounting. A handy  
steering column control which permits  
sounding the three horns singly or in  
any combination, is included at the  
list price of \$12.95.

**DON'T FILE POINTS!**

**Flex-Stone**  
REG. U.S. PAT. OFF.

**Flexible Contact Dresser**

- Takes the hardest of Tungsten Points.
- Bends in where a file can't reach.
- Cleans and Dresses all Electrical Contacts.

*Ask Your Jobber or Write Direct*

RINCK-McILWAINE, Inc., 16 Hudson St., New York



## Manhattan Announces

**New Coil**

The Manhattan Insulated Wire Co.,  
3602 Thirty-fifth Ave., Long Island  
City, N. Y., has announced a new au-  
tomobile coil whose chief feature is an  
all bakelite container, designed on the  
multi-fin principle of air cooled gas  
engines. Being on the horizontal, the  
fins receive the maximum amount of  
the air current created by the fan  
and the cooling process is further  
aided by the jacket itself. This type  
of construction is used to offset the  
major cause of coil breakdowns—in-  
ternal heat.